

SUBTERRANEA BRITANNICA

SECRETARY'S NEWSLETTER No. 25

2002



Shorts Brothers - One of the 100 metre factory tunnels



**SUBTERRANEA
BRITANNICA**

www.subbrit.org.uk

Subterranea Britannica is a society devoted to the study of man-made and man-used, underground structures and the archaeology of the Cold War. The main focus of interest is on abandoned and forgotten structures and, in the case of Cold War structures, studies are entirely confined to declassified and decommissioned structures.

The society is open to all and its membership includes all walks of life. Members are invited to contribute to this newsletter even if this just means sending very welcome snippets from newspapers and magazines.

Editor Dan McKenzie

Please send contributions to;

Dan McKenzie 53 Home Pasture, Werrington, Peterborough PE4 5AY

Tel: 01733 324187 Fax: 01733 320304

E-mail: dan.mckenzie@bunkertours.com (128k Broadband)

Contents Autumn 2002

Shorts brothers tunnels3

Photo CD Offer.....5

General News.....6

The 2002 5th International Souterrains Conference at Liverpool..... 11

Godstone Mines and Quarries in Surrey in 1900 13

Book reviews and News 13

Joseph Dickinson, Inspector of Mines21

Gatton Tower Wood Quarry23

Caves, Cairns, Tunnels, Passages and Pits26

The Gros Ouvrage Hackenberg.....31

The Eastwall in Poland.....33

Fortress Alderney.....38

West Norwood Cemetery Catacombs.....46

Newsletters of Subterranea Britannica are published by the committee of Subterranea Britannica. Original articles , book reviews, press cuttings, extracts from books and journals, letters to the editor etc. are welcome. However the editor reserves the right not to publish material without giving a reason.

The committee of Subterranea Britannica and the editor do not necessarily agree with any views expressed and cannot check the accuracy of any material sent in.

Shorts Brothers Tunnels – A brief history and visit report

On 23rd September 1941 Shorts Brothers contacted the Ministry of Aircraft Production regarding their seaplane works at Rochester seeking authority to build a new underground works in tunnels excavated under chalk cliffs behind their existing MAP extension factory on the south bank of the River Medway.

Space was urgently required for 75 new machine tools as their works were full to capacity. The tunnels were intended to create 12,000 square feet of workshop space at a cost of £20,000 which, it was acknowledged was somewhat higher than a new surface building but stress was laid upon the vulnerability of the Medway estuary.

the tunnels were excavated consisting of two parallel tunnels, each one hundred metres in length, these were linked by four 75 metre long adits to the cliff face at the rear of the factory. The tunnels were for the most part cut from chalk and brick lined (one of the adits was unlined). There were also two 45 degree ventilation shafts extending to the surface.

The project was given the go ahead and

At the eastern end of the tunnels the



One of the 100 metre factory tunnels - Nick Catford

company built an extensive network of air raid shelter tunnels again consisting of two parallel drives running parallel with the cliff face, each was three hundred yards in length connected by 14 crosscuts. These were connected to the Shorts Factory tunnels by a single tunnel 400 metres in length and by 9 adits of varying lengths out to the cliff face. There were three vertical ventilation shafts to the surface which were also fitted with ladders for emergency escape.

Post war, the southern section of the tunnels was used for storage and workshops by Blaw Knox Ltd, contractors plant manufacturers, (a subsidiary of the Babcock International) who had taken over the former Shorts Site. They remained at the site at least until the late 1980's. During the late 1990's the site was cleared and is now occupied by a modern housing estate. Most of the adits were backfilled and are no longer visible at the surface. The two main adits into the Shorts Factory tunnels have been retained. The land in front of them has been built up to within two feet of the top and the remaining hole has been grilled with a small gate which is kept securely locked.

Some of the other adits have been bricked up rather than backfilled with a small hole left for ventilation or bat access. Brick walls have been built across the main tunnels at various points to prevent through access but these have all been breached. The tunnels are generally free of graffiti and modern rubbish and there are no roof falls anywhere. During a visit in 2002 entry was gained via the westerly of the two accessible adits which is approximately 2 metres wide and two metres high, it is lined with brick with a curved corrugated iron roof. There are fluorescent lights at regular intervals. After 75 yards the passage crosses the first of the main factory tunnels. This is approximately 100 metres in length, 6 metres wide and 4 metres high, after a further 12 metres there's the parallel tunnel of similar dimensions. At the northern end of this tunnel, opposite the entrance adit, is the ventilation plant room still containing a large fan, motor and electrical switchgear. Beyond the fan there are two rusty steel doors leading to

the 45 degree ventilation shaft. The shaft starts ten feet up the wall but a ladder has been lashed in place allowing access to it. The shaft is roughly circular lined with corrugated sheeting. It can be climbed with care but at the top there is a 10 foot vertical section giving access to a manhole at the surface. From the plant room there is ventilation trunking running through the factory section of the tunnel network but not into the air raid shelter.

At the Southern end of the 'factory tunnel' is another plant room but all that is left is a concrete engine bed, two more steel doors and another angled ventilation shaft. The factory tunnel itself is largely empty apart from some brick shelving in the middle and a number of old filing cabinets. At one end there is a long table across the passage, this table and the floor in front of it is stacked with wooden formers for making sand moulds for various engineering parts. There is also some machinery of unknown use. In the middle of the passage is a cross cut to the other parallel passage, this is stacked with papers and microfiche from Blaw Knox. The other passage is completely empty but half way along there are two wooden doors with some electrical switchgear alongside. One door leads to the male and female toilets, with doorways into them partially bricked up and the other door leads to a low unlined adit to the cliff face; this is bricked up at the end.

At a point between the two parallel tunnels there is a single tunnel running northwards for 400 metres. The tunnel is 2 metres wide and 2 metres high with brick walls and a curved corrugated roof. Most of the shelter tunnels are of these dimensions. After a few yards a brick wall has been built across the tunnel with a substantial metal plate bolted to the brickwork. The brick wall has been breached and the plate pushed out of the way allowing access to the rest of the tunnel network. At 50 metre intervals along all the shelter tunnels, adits and crosscuts there are recesses (alternating between left and right side) consisting of a 4 metre length of tunnel parallel to the main tunnel. These are male and female toilets. There is a sign at each doorway indicating whether it was a female or male toilet. There is no evidence of doors so

presumably there were only curtains. There are also 'No smoking' signs at regular intervals on the walls, these also date from the war. There are the remains of wooden bench seats along the walls.

After 100 metres there is a cross roads, left leads to an entrance, now backfilled and right leads to a parallel shelter passage running north. The two passages are forty metres apart. There are 12 cross cut passages linking them. Two of the cross cuts extend eastwards for 5 metres, these would have been wardens or first aid posts. All but two of the crosscuts have short side passages in the middle running 5 metres either side of the cross cut to a dead end.

On the west side of the western parallel shelter tunnel there are eight tunnels of various lengths leading to shelter entrances, some of these also have short sections of side tunnels. All of them are blocked some by backfill and some by original steel doors with backfill beyond. A few yards along one of these tunnels there is a well covered with steel doors. The well is approximately .7 metre wide and lined down to water level which is about 20 feet down. In-between the entrance adits are three ventilation shafts and an emergency escape shaft, these are all accessed by

short adits leading to vertical shafts. The emergency escape shaft has step irons and can be climbed to a manhole cover. There is a sign above each ventilation adit telling shelters to keep clear of it. There are small niche's cut into the wall at regular intervals for first aid kits and many of them have a sign indicating 'first aid kit'.

After 100 metres there is another cross roads and the parallel tunnels joining again with a single tunnel continuing north for a further 60 metres to a final crossroads where there are a number of original metal grille gates, now detached. Right and straight ahead are dead ends after 20 metres, left is the final entrance (blocked) and part way along it several storage bays. This area of the tunnel network is very clean and indicates perhaps some more recent use.

Nick Catford 22.1.2002

Sources:

Secret underground cities by N J McCamley

Journal of Chelsea Speleological Society Volume 22

East Germany Bunker Tours - 2001 / 2002 Photo CD by Mike Barton

I have produced a CD with photos of numerous bunkers that were formerly operated by the Soviet forces in East Germany, by the East German armed forces or by the Stasi (EGER secret police). Each of some 30 locations are contained in their own file, some maps, sketches, etc. have also been included. Most of the photographs were taken during my pre-tour recce, i.e. there are no intrusive "foreign bodies" to be seen. Anyone interested in obtaining a copy should transfer five pounds to the following account:

Royal Bank of Scotland, bank sort code 16-20-31, account No. 11158175 in my name.

Inform me of your name and address AFTER transferring the money. The CDs will be dispatched shortly afterwards.

Name:

Address:

Postcode: **Phone:**

Email: **Transfer Completed on**

Send To: Mike Barton, Brucker Weg 29, 91054 Buckenhof, Germany

Tel / fax: 0049-9131-52147 Email: mailmikebarton@aol.com

A newspaper in Rome (May 31st 2002) -

has revealed that a tunnel beneath the city was planned as an escape route by Mussolini. Secret passages leading from the Palazzo Venezia, the Fascist leader's palace base, were designed for travel by car. 'Il Messaggero' reported that the system, 15 feet beneath the Eternal City and a quarter of a mile long, runs below the Roman Forum and emerges near the Colosseum. It is thought to have been built towards the latter part of the 1930's. An architect who was exploring the underground passages of the monument to King Victor Emanuel II found the secret tunnel by chance two decades ago.

Source - Roger Morgan

Pedestrian tunnels in Houston, Texas

There is a network of interconnecting underground tunnels for pedestrians concentrated in the downtown area of Houston, Texas. They run for several miles and connect all the major office buildings and hotels in the business area. They are very impressive, well lit and air conditioned and contain shops and restaurants.

They are not secret or restricted access in any way, but many Houstonians are oblivious to their existence. The weather in Texas is extremely hot and humid, especially in the summer, so the tunnels provide a comfortable environment for office workers in the downtown area to have lunch or simply to walk around and get from a to b.

The traffic in the downtown area is so bad with so much construction always going on that it's usually quicker to walk through the tunnels rather than try to drive anywhere.

Part of the network got flooded by a tropical storm in 2001 but is now fully restored.

Source Gavin Christie

Base might get frozen in history Some hope to make it monument to Cold War

UPPER HEYFORD, England -- Just a decade ago, U.S. bombers thundered down the runway here in their mission to protect the free world. Eight F-111s armed with nuclear weapons, their pilots always nearby, stood ready round the clock. Today, the airstrip serves as a parking lot for 20,000 cars. Cattle graze on the fuel dumps, and the barracks house high-tech start-up companies. The yard-thick concrete hangars provide impregnable protection for medical records. Bomb stores hold a different sort of explosive: fireworks.

The British government and historic preservationists want to turn this former U.S. air base -- one of the largest and most critical frontline defenses against the Soviet Union -- into the United Kingdom's first monument to the Cold War.

Preserving Upper Heyford as a symbol of 40 years of nuclear tension, officials say, is as essential as protecting battlegrounds and cathedrals. Opponents, who consider the base an unsightly gash on the otherwise bucolic Oxfordshire landscape, would like to see most of it razed and turned into a park.

"Heritage doesn't just involve medieval castles and standing stones," argues David Went, inspector of ancient monuments for English Heritage, the government group responsible for selecting cultural sites for statutory protection. "These structures mark a point in time that shaped all of our lives, and it is rapidly passing out of memory."

English Heritage has just completed an inventory of the country's Cold War sites, from bunkers and bomb shelters to bases. It has made Upper Heyford its top priority because of pending proposals to build houses on the site and allow other parts to revert to the original pastoral state.

Hearings are being held. Officials could rule on the future of the base by year's end. But by all accounts, it appears certain that at least a portion of the base will be declared historic, making it the most important, and possibly the first, nationally sanctioned Cold War memorial

in the world.

Bills pending in Congress would authorize the Interior Department to inventory Cold War sites in the USA, but there has been no organized effort to preserve monuments from that era, says Gary Powers Jr., son of U-2 pilot Francis Gary Powers, who was shot down over the Soviet Union in 1962. In the USA, remnants from the Cold War have been preserved, but nothing on the scale of an entire base. Gary Powers runs an online Cold War museum and lobbies for preservation of Cold War sites.

Created during World War I and then used by the Royal Air Force during World War II, Upper Heyford was taken over by Americans in 1950 to serve as a frontline base for the U.S. Strategic Air Command.

In an effort to recreate a slice of America in the heart of rural England, existing housing, deemed too small by American standards, was enlarged. A shopping mall, bowling alley, baseball diamonds, pizza parlors and donut shops were added to Americanize the base. Even today, U.S.-style fire hydrants and street signs pepper the 1,250-acre site, set among the rolling hills and farmland of rural England.

At its peak in the 1970s and '80s, 13,000 U.S. servicemembers were stationed at Upper Heyford. Three U-2 spy planes flew out of the base, patrolling the perimeter of the communist Warsaw Pact countries. About 75 F-111 fighter-bombers were housed here in 56 monolithic, concrete hardened shelters that give the rolling landscape an eerie sense of the secret world of the Cold War.

"This was not a public war like other wars," Went says. "There are no battlefields or burial grounds. You don't even have grandpa's memories. It was all locked away, and all you saw were the gates."

Since the U.S. Air Force left Upper Heyford in 1993, planners, developers and preservationists have debated what to do with the base. Local officials wanted to return it to its original "green" state. A consortium of builders, which runs the site, had hoped to build as many as 5,000 new homes. One local preservation group

says it should be completely protected, including the 1.9-mile airstrip -- the longest in Europe.

"It's prominent, it's austere, and it's an intrusion into what was once open countryside," says Patrick Burke, planning policy manager for Cherwell District Council. The council, which wanted to see the site returned to parkland, has now grudgingly accepted that because of their historical significance, some parts of the base should be preserved.

Ardent preservationists envision Upper Heyford as the prime Cold War monument for Europe, complete with a museum, bomber planes in the hangars and tours for visitors and schoolchildren. The entire sweep of the base must be protected, they argue, to convey the nature of a war that never required a battlefield and was unlike any other in history.

"It is the best existing example of Cold War landscape and architecture," says Frank Dixon of the Oxford Trust for Contemporary History. "The reason we all don't speak Russian is that that base was there. It helps us understand that the peace we have today is a result of the Cold War."

Source Ellen Hale - USA TODAY

South Gloucestershire Mines Research Group

What is it??

The South Gloucestershire Mines Research Group is a new group, so new we haven't yet had our first AGM or adopted a constitution. We will cover all aspects of mining in South Gloucestershire from pre-historic times to recent extraction and processing of metalliferous, industrial and other minerals in our area.

Where were the mines in South Gloucestershire?

The main mining in South Gloucestershire has been:

Coal mining over a large area of the

district –around Yate in the east and right up from the south of the district in the Kingswood area of Bristol, to Cromhall in the north. Iron mining in the Iron Acton and Frampton Cotterell areas. Lead and Silver mining in the Almondsbury and Itchington areas. Celestine in the Yate area

What is planned? - Inaugural Meeting

We plan to hold this on Thursday 3rd October in Coalpit Heath Village Hall starting at 7.30pm. This will be the first chance we will all have to get together with everyone we have spoken to about the formation of the group

Expected Cost of Membership

We expect an annual charge of around £15

Benefits of Membership

Newsletter (probably quarterly), access to physical and virtual archives, group third party liability insurance cover and perhaps the most important of all the opportunity to share your interests with fellow enthusiasts

What's been happening so far?

We have had 2 open days in May and June at Old Wood Pits in Rangeworthy (attended by over 100 people) as well as our ongoing research work. We have also held our preliminary planning meeting to set up the group formally.

Proposed Scope of Initial Work

We have a number of mine sites where excavation is already underway and an additional number where permission is already given. We also expect to undertake broadscale field based work as well as investigations into available records

Additional Information/Contact

Roger Gosling – 01454 883607

Email: roger.gosling@blueyonder.co.uk

Officials try to shift blame as Prague's metro floods

The passages descending into Florenc station on Prague's underground system are eerily quiet. Where there are usually thousands of passengers, there are now a few emergency workers in white helmets tending thick hoses that weave down the stairs and escalators. Below, the hoses trail into millions of gallons of muddy water.

Florenc is one of 17 underground stations out of Prague's total of 51 that have been left submerged by the floods that devastated the Czech republic and large swathes of Central Europe last week.

Its platforms lie beneath 120 feet of water which has submerged two trains still on the tracks at the station.

Nobody was hurt as the flood waters poured into the metro system but the people of Prague, faced with an estimated repair bill of at least £50 million are asking angry questions about how it was allowed to flood.

Officials from different city departments are trying to pin the blame on each other. Police will question the system's director and other city officials. The police investigation could lead to charges that the officials endangered public safety.

The system was built as a prestige project in the 1970s, a few years after the 1968 Soviet invasion that forced Czechoslovakia to stay in the Communist bloc.

It was to double as a network of fallout shelters in case the Cold War escalated into nuclear conflict. Steel doors, several feet thick, were fitted at each station to seal off sections of the tunnels, platforms and entrances. These were also supposed to withstand floods.

But as Prague flooded last week, instructions to shut the doors were given too late at many of the stations. By the time they were received the electricity to operate the door mechanisms and water pumps had been knocked out by the flood and stations and miles of tunnels were filled by the swollen Vltava river which bisects the city.

The result has been disruption for hundreds of thousands of the capital's inhabitants and tourists. Journeys to and from work have become endurance tests in packed buses and trams forced to take convoluted routes because some of the river bridges are still unsafe.

The roads are often at a standstill as people who normally use public transport take to their cars. Milan Houfek, the head of the underground railway, said officials monitoring the flood had badly underestimated how high the waters would rise.

"If we had closed the metro earlier, such a level of damage might have not been caused," he said. "However, we, as well as the Prague emergency committee did not know there would be so much water."

Michaela Kuharcova, a metro spokesman, said a limited service is now working along some sections, with 23 functioning stations. "We hope to get some more stations open in the coming weeks but the whole network will probably not be working until about Christmas," she said.

Ms Kuharcova added that the total cost of the damage would be known only after the waters had been pumped out.

The floods have affected many of the stations near Prague's most popular tourist sites such as the city's central Wenceslas Square and the Old Town Square.

Among the British tourists in Prague yesterday were a nine-strong party of firemen and a policeman on an extended stag party for a Surrey fireman, Ian Davis from Surbiton.

He said he and his friends had booked their trip six months ago and were determined to go through with it despite the floods.

"We were moved from the hotel we had originally booked because it was flooded," he said. "Last year we were involved in fighting the floods in Britain and clearing up.

"A bit of the edge has been taken off our enjoyment because we are aware many people have suffered here. We've seen firemen at the underground stations and

elsewhere doing similar things to what we did last year. They seem to be doing a good job."

His best man, Nick Burley, said: "I'm sure the flooding in the metro has disrupted many people's lives but for tourists, as long as you're not staying far out of the centre, it's quite pleasant walking around a city as beautiful as this one."

The metro system was not the only Soviet-era piece of underground architecture in the capital to be affected. A huge underground nuclear bunker for government officials including the president and prime minister was also flooded, according to Czech sources.

By Askold Krushelnycky in Prague

***From the Sunday Telegraph
25/08/2002***

Whitehall Upgrades its Radiation Monitor

The UK Government is improving its radiation monitoring system designed to help officials respond to a nuclear emergency

The system for monitoring radiation around the UK is to be upgraded, following the announcement of a contract between the Department of Environment, Food and Rural Affairs (DEFRA) and IT consultancy Logica on 28 August 2002.

Under a 10 year contract worth £16m the company will design, build and maintain a new version of the system known as the radiological incident monitoring network, or RIMNET 3.

Logica's project manager, Paul Dickey Collas, told Government Computing News that the existing version of RIMNET is approaching the end of its 10 year lifespan.

DEFRA is the nominated lead Government department in the event of a nuclear accident, and would be responsible for co-ordinating the Government's response in dealing with effects on the UK.

A number of monitoring stations and the

country provide RIMNET with real time readings on radiation levels from a fixed telemetry network. These are fed into the database and would enable officials to make decisions during an incident or emergency.

"We're bringing the technology up to date," he said. "We're providing various different mediums for DEFRA to contract and liaise with emergency services and local authorities."

The new system will incorporate software from Microsoft, Veritas and ESRI. RIMNET 3 would continue to use The Meteorological Office model to predict the dispersion path of the radiation cloud following any accident.

Dickey-Collas said the new software reflects the advances in technology and will provide a more resilient system. He said it should be up and running by the end of August 2003. DEFRA would not comment on the contract.

Kable's Government Computing

Source Bob Templeman

Deep Dark & Dusty

Deep Dark & Dusty is a new video telling the story of Bathstone and its underground quarries and quarrymen from Roman times to the present day.

This technically well produced and well lit film traces the fascinating history of Bathstone quarrying and the later use that the abandoned mines were put to including munitions storage, underground factories, mushroom growing, a wine warehouse and a unique underground vault for art treasures.

It is well illustrated with old photographs and most of the accessible stone quarries in Wiltshire and north east Somerset are visited including Box, Eastlays, Monkton Farleigh, Ridge, Spring, and Copenacre with some interesting footage from Tunnel Quarry which is still in MOD hands with visits rarely permitted.

Modern stone production is well illustrated too with film from working

quarries at Monks Park, Limpley Stoke, Westwood, Pickwick & Chilmark.

The running time is a lengthy 2 hours which might seem unnecessarily long but with such a detailed and diverse story it needs every minute of this length.

For those interested in industrial archaeology or military history this film is an absolute must.

The cost of the video is £19.95 plus £2 P & P and it is available from the producers MVP Video at 3, Ash Grove, Guildford, Surrey, GU2 8UT. Please make cheques payable to 'J R Menday MVP A/C' also available from Mike Moore Books www.moorebooks.co.uk

Source Nick Catford

Well at Crowsley Park

The BBC monitoring site at Caversham has a aerial site at Crowsley Park. 'Crowsley House has an underground well. You drop down a narrow flight of stairs in the corner of the scullery and go through 30 feet of brick-lined tunnel a little under 6 feet in height.

You then emerge into a circular chamber outside the walls of the house, This is again brick-lined and about 15 feet in diameter and 9 feet high. In the centre is a 3 foot diameter well. It is about 160 feet deep.

There is also a legend about a tunnel that runs under the river Thames from Cavendish Park to Reading Abbey.'

The 2002 5th International Souterrains Conference at Liverpool, 8th - 12th August 2002

Three of the leading members of Friends of Williamson's Tunnels of Liverpool attended an international conference at Starigrad Paklenica on the Adriatic coast of Croatia, during September 2000. They formed, in fact, three quarters of the British contingent on that occasion (I was the other quarter.)

At the close of the Starigrad meeting, the FOWT contingent volunteered to host another such gathering in Liverpool in 2002, and this they have now handsomely done.

The conference venue was, appropriately, the about-to-be-opened visitor centre at the old Corporation Stables site in Smithdown Lane, Edge Hill. Only a very few years ago, this was a more or less derelict site, with two large brick arches and some rather small black holes, all more or less blocked by earth, building rubble, and Victorian and later domestic refuse. This site is now transformed, the arches and tunnels cleared of debris and fully accessible, and a large glass-fronted visitor centre created in front of them. This was the location for the lectures, buffet meals, bar, and social gatherings.

The lecture programme and visits were supported, also, by the Grosvenor Caving Club, and the

P a r y s Underground Group.

Presentations included Sylvia Beamon (on Royston Cave, and on health treatments in uranium mines); Joep Orbons on computer mapping of Dutch and Belgian underground quarries; Luc Stevens on underground sites in France; David Jenkins on the Parys

Mountain (Anglesey) copper mines; Steven Brown on the mines of Halkin Mountain (near Mold); the Ukrainian delegation's video on the natural gypsum caves of Chortkiv; and your reporter on various aspects of underground space below British towns and cities, whether viewed as cultural heritage or as statutory nuisances.

The underground sites visited ranged from commercial tourist attractions to



The site of the former Dingle Station on the Liverpool Overhead Railway - now a car repair workshop Photo Nick Catford

Those attending came from Belgium, The Netherlands, Switzerland, and Ukraine, with three British Subterranea Britannica members (Sylvia Beamon, Julia Milsom, and Paul Sowen) and a number of local FOWT and Joseph Williamson Society members. The low SB turnout no doubt reflects the fact that we held our own Study Weekend in Liverpool only a few years ago, and our Summer 2002 Study Weekend in the Black Country only a month before.

abandoned mines requiring full caving gear. They were the High Park Street reservoir near Toxteth church; the Liverpool Overhead Railway tunnel and underground station at Dingle; the Western Approaches HQ; three separate parts of Williamson's tunnels, at the Stableyard, Mason Street, and Paddington sites; the Hack Green bunker at Nantwich; a selection of mines and natural caves near Mold; the Dinorwig pumped-storage power station at Llanberis; the Paws Mountain copper mines; the disused platform at James Street Station; and the Cavern Club!



Williamson's double tunnel in the stable yard at Smithdown Lane in 1998 before restoration Photo Nick Catford

Progress made underground by FOWT, JWS and PUG members at Paddington, Smithdown Lane, and Parys Mountain since our last visit was impressive. The Visitor Centre at Smithdown Lane includes a circular tour through tunnels into the cliff below Mason Street. And at the Paddington site an immense mass of building rubble has been cleared, allowing access to at least two levels underground, and a secure entrance and steel access stairway installed. Members who visited the Parys Mountain copper mines during the course of the SB North Wales Study Weekend will recall the awkward access underground via a steeply inclined narrow corrugated steel tube! This has now been replaced by a walking height doorway, leading to the original flight of stone mine entrance steps. Beyond that, the tunnels, stopes, and short ladder connections are unchanged.

We saw, in passing, some of the safety improvement works in the Liverpool

Birkenhead road tunnels, in response to the Mont Blanc road tunnel fire in which 39 people died in March 1999. The older (1934) Queensway tunnel is a single bore structure accommodating traffic lanes in

both directions. It was planned and built with a substantial space below the road deck, intended but never used to accommodate trams, but hitherto used only for the intake ventilation air. Escape points are to be constructed to allow emergency pedestrian egress via this void and the ventilation towers at each end. The Kingsway single-bore tunnels, opened in 1971 and 1974, serve northbound and southbound traffic separately; they are being linked by short cross-passages which will allow pedestrian escape from an accident in one tunnel, via the other.

Other attractions

Other attractions were a reception in Liverpool's impressive town hall, a buffet in the top floor of the Royal Liver Building, and a round trip on the Mersey Ferry. It is expected that the Conference Proceedings will be published.

Paul W. SOWAN

GODSTONE MINES and QUARRIES in Surrey in 1900

From: Arthur Andrews, 1980, Godstone in 1900. 3rd impression - with map. Godstone Preservation Society: ii + 2lpp.

Pages 1 - 2 - sand mines

Behind the timber yard, on the left, was an ancient cottage known as Squatter's Cott, and on the right, near the Hare and Hounds, was Ned Bish's shed. When this was pulled down about 1913 to build Green View Terrace, a huge shaft was found under it, with galleries branching from it in all directions under the adjoining land. This was one of the silver sand mines, often sunk and worked surreptitiously, for which Godstone is famous - it was known as "smuggling." The fine sand was used in the 18th Century for hour glasses, for scouring - household soap was unknown - and in lieu of blotting paper. There was a regular traffic in it, together with poached rabbits, to London via the coach-drivers and wagoners. In 1900 it was still going there, for scattering on pub floors and sale as silver sand.

Pages 13 - 14 - hearthstone mines and building stone quarries

No description of Godstone would be complete without some picture of the hearthstone quarries, or rather mines, for they were underground. About halfway up Godstone Hill, on the left, there was an extensive area dotted with sheds and stacks of cut stone left to harden after being excavated. Several shafts entered the hillside or dived under the road, leading to a complicated network of galleries extending far to the east of the road as well as under Fosterdown Hill, and covered many acres. There was another quarry on the road that goes up to Quarry Farm, on the right of the dual carriageway. There were two kinds of stone: a very soft white stone which was cut into blocks for whitening doorsteps

etc., the dust being sold for making Blanco and other dressing; and the hard hearthstone which lay above it. This was used for paving, building and furnace lining. Both were cut into blocks and pulled out of the mine on trolleys dragged by ponies. The hearthstone was cut up, stacked and left to harden before being carted to Caterham Station for dispatch. The soft stone was packaged quickly as it disintegrated on exposure to air. In their heyday, the Godstone mines were producing upwards of 50,000 tons a year, but the demand had fallen by 1900 and only a few lasted through the 1920s. Fairalls reopened one of them during the Second World War, to save imports, but this was closed about 1950. This was the end: the quarry floor was filled in during the 1950s and no trace of the workings is visible. There was a public weighbridge on the right of the road, about halfway up, but the dual carriageway now covers its site.

So ended what had been an important local industry of hundreds of years' standing, for Godstone stone is reputed to have been used in the Tower of London and Windsor Castle, as well as the wall of Godstone Place. Aubrey, in 1673, refers to 'excellent Quarries of Freestone.'

Paul W. SOWAN

Book Reviews

The London Railway Record 31 (April 2002): 181 - 216pp

£2.50 + p/p from Connor & Butler Ltd, 25 The Colchester Business Centre, 1 George Williams Way, COLCHESTER, Essex CO1 2JS 01206-368863 Fax01206-513478

This issue contains, inter alia,

Geoff GOSLIN, London Locomotive Record. No. 8: They Beyer Peacock 4-4-OTs (pages 182- 186)

Ian BAKER, Tracing disused railways near Croydon Tramlink (pages 187 - 199)

Especially the Woodside and South Croydon line including Selsdon Station and Spencer Road Halt; the Addiscombe branch and station; and Merton Park and the Merton Abbey line]

J.E. CONNOR, The dawn of the Southgate Extension (pages 200-212). Historical and descriptive details for the Piccadilly Line extensions opened from Finsbury Park to Arnos Grove 19 September 1932; onwards to Enfield West 13 March 1933; and finally to Cockfosters 31 July 1933. Two single-track tunnels of 930 and 928 yards were made at Southgate - photographs of north and south portals are included.

Paul W. Sowan, 7.5.2002

Nottingham's underground maltings and other medieval caves: architecture and dating. Alan MacCORMICK. Trans. Thoroton Society of Nottinghamshire 105, 73 - 99. 2001.

This paper identifies, from documentary and archaeological evidence, 28 medieval underground malt kilns and 27 other medieval rock-cut cellars amongst the over 430 'caves' known to have been carved out of the sandstone under Nottingham. The two groups of medieval 'caves' contain decorative features derived from high-status architecture.

Plans, sections, photographs, drawings, and descriptions of surviving cave maltings are provided, and of their decorative features.

Appendixes list the cave maltings and other medieval caves, and medieval records of caves. Some remain accessibly, others are currently inaccessible or known to have been destroyed.

There is a list of 24 references to published and ms. Sources

Paul W. SOWAN 25.5.2002

Archive sources for the history of quarrying. Institute of Quarrying. 2001 (?). Free from The Institute of Quarrying, 7

Regent Street, NOTTINGHAM, NG1 5B5. 0115-941-1315. Fax 0115-948-4035

mail@quarrying.org www.quarrying.org

This AS pamphlet issued as a guide to historical research sets a bad example by lacking its date of publication, which I assume to be 2001! On internal evidence it is certainly 2000 or later. It has no stated ISBN. It outlines at a very basic level the general nature and availability of most of the more obvious sorts of printed and manuscript sources available for quarry history. Formally published materials are sometimes not sufficiently closely bibliographically described, which could lead to difficulties in locating copies in or via library services. Whilst the resources, published and otherwise, are briefly noticed, there is no specific mention of the wealth of information to be gleaned from field club geological excursion reports, or from the leading geological societies' periodicals and other publications, surely a major source!

There is a useful list of addresses and other contact details (including e-mail and websites) for national bodies, although again the Geological Society and the Geologists' Association are not included.

With all deficiencies, this booklet is nevertheless potentially helpful to a beginner in quarries research. It might have been helpful, for such beginners, to have explained that, especially before the Quarries Act, 1894, many minerals workings described as quarries were in fact subterranean, and that many such subterranean workings for non-metalliferous minerals were subject to the Metalliferous Mines Regulation Act, 1872!

Paul W. SOWAN 22/12/2001

Gullnáman i borrmósdal . GUOMUNDUR J. GUDMUNDSSON. Arbok hins íslenska Fornleifafélags. 1999 111-128.

Reports on archaeological investigation of

two small mining trials tunnels at Seljadalsa in the Mosfellssveit district, about 10 km north east of Reykjavik. These were made by British and German companies in the second and third decades of the 20th century, in search of gold. Although traces of gold had been found, no source was located rich enough to work.

The paper includes photographs of the site and tunnels, plans and sections of the latter (amounting only to a few tens of metres altogether), and photographs of artifacts discovered including some light railway track.

Amongst the prospectors was the Iceland Minerals Syndicate Ltd, of Charing Cross, in London.

P. W. SOWAN 24.11.2001

Oldham coal. Gerry FANNING. : British Mining 68: 161pp. 2001. ISBN: 0-901450-54-5. From Northern Mine Research Society, 38 Main Street, Sutton in Craven, KEIGHLEY, Yorkshire BD20 7HD. 01535-635388. martgill@legend.co.uk

An overview introduces the geology of the Lancashire coalfield, the geography of Oldham, and mining methods employed. A chapter then reviews the evidence for early coal-mining throughout Britain. This is followed by detailed chapters addressing the recorded history of coalmining in Oldham from 1700 onwards, mining ceasing in the area in 1968.

Working methods and conditions, safety and accidents, and productivity are discussed.

Fireclay mining and copperas production, in connection coalmining, are with mentioned briefly. The major collieries all had their own brickworks.

The work is illustrated with maps, line

diagrams, and photographs. Extensive references are provide to sources.

Paul. W. SOWAN 22.12.2001

A railway find. Tim SMITH. Newsletter Wealden Iron Research Group 34, 6 - 8. Sheila Broomfield, Secretary, Wealden Iron Research Group, 8 Woodview Crescent, Hildenborough, TONBRIDGE, Kent TN11 9HD. 01732-838698. Fax 01732-838522 .

c.broomfield@dia1.pipex.com

Reports archaeological examination of mid-19th century ironstone mine galleries (one equipped with iron tram rails) at Snape Wood (TQ 634302) south of Wadhurst (East Sussex), either side of the still in use Tunbridge Wells to Hastings railway.

Siderite (iron carbonate) ore having been found as a result of making a railway cutting at this point, the mine galleries were driven from August 1857, but the enterprise was abandoned in September the following year, the ore evidently having an unacceptably high silica content, and correspondingly low percentage of iron. Such ore as was worked was sent to Staffordshire for smelting.

Paul W. SOWAN 24.11.2001

London's disused underground stations. 2nd edn. J.E. CONNOR. Capital Transport Publishing: 128pp. 2001. ISBN: 1-85414-250-X hardback. £ 19.95 + p/p from Capital Transport Publishing, 38 Long Elmes, HARROW WEALD. On sale at the British Library's bookshop, the London Transport Museum bookshop, and the Ian Allan Bookshop at Waterloo

Abstract:

This is a revised and enlarged edition of the author's book published in 1999. It describes the history and current state of

abandoned stations on the London Underground railway system (surface stations as well as those below ground.)

The subsurface stations are Aldwych, British Museum, Brompton Road, Charing Cross

(Jubilee Line), City Road, Dover Street, Down Street, King William Street, Lords (St. John's Wood Road), North End (Bull & Bush), St. Mary's (Whitechapel Road), South Kentish Town, Wood Lane, and York Road.

The book is illustrated with contemporary and modern photographs, station plans, etc.

Paul W. Sowan 28.2.2002

The Waterloo & City Railway. John C. GILLHAM. Oakwood Press: Oakwood Library of Railway History.(OL 117): 464 pp. 2001. ISBN 0-85361-544-6 hardback. £35

This is a large volume in small print, chronicling every aspect of the planning, construction, and subsequent history of the Waterloo & City Railway

Tunnel construction is described in Chapters 5 (pages 51 - 64) and 7 (80 - 83), and the line's relationship to the Bakerloo, Central, and main line railways. There are full accounts of the line's own generating station (Chapter 10, pages 99 - 110), equipment, and rolling stock. A never-implemented scheme to extend the line to connect with the East London Line at Shoreditch is described.

Appendices give extracts from the Company's Act, tunneling contract, specifications for the generating station and electrical equipment, an known air-raid fatalities at Bank Station on 11 January 1941. References to sources are embedded in the text.

Paul W. SOWAN 28.2.2002

The Royston Cave: used by saints or sinners? Local historical influences of the Templar and Hospitaller movements. Sylvia P. BEAMON. Baldock: Cortney Publications: xx + 314pp (hardback). 1992. 0-904378-40-3. £ 39.50 + £ 4 p/p from Mrs. S.P. Beamon, 2 Morton Street, ROYSTON, Herts SG8 7AZ 01763-242120 Fax 01223-235503

The work deals with Royston Cave, a Scheduled Ancient Monument of apparently medieval date, excavated into solid chalk under the centre of the town, close to the Cambridgeshire / Hertfordshire border. The 'cave' walls are liberally ornamented with carvings of religious symbols and figures.

Chapters deal with the accidental discovery of the cave in 1742 and its subsequent history and present condition; the general and local history of the Knights Templar, and of Royston and Cambridgeshire and Hertfordshire; descriptions and interpretations of the carvings; comparisons with similar sites and carvings throughout the UK and mainland Europe and with the Church of the Holy Sepulchre in Jerusalem; and conclusions.

The work is profusely illustrated with photographs (10 in colour) and diagrams (some folded.) There are 15 appendices, a 12 page bibliography, and a 16 page index.

Paul W. SOWAN 8.10.2001

Rough quarries, rocks and hills: John Pull and the Neolithic flint mines of Sussex. Miles RUSSELL. Oxbow Books: Bournemouth University School of Conservation Sciences Occasional Paper 6: xv + 287pp 8vo softback. 2001. ISBN: 1-84217-054-6

£ 27 (+ p/p) from Oxbow Books, Park End Place, OXFORD OXI 1 HN. 01865-241249. Fax 01865-794449.

This volume includes a biography of John H. Pull (1899 - 1960) by Sally White; a chapter on flint mine excavation methodology; reviews of excavations in Sussex at Blackpatch (1922 - 32), Church Hill (1933 - 39 and 1946 - 52), Tolmere (1949), Cissbury (1952 --56); additional fieldwork; a catalogue of surviving flintwork from the Worthing group of mines; a conclusion 'Sussex mines in context'; five appendices on Sussex flint mine excavations; and a bibliography. There is no index, but the contents pages are a detailed guide in themselves. The work is liberally illustrated with site plans, mine plans and sections, and black-and-white photographs.

Paul W. SOWAN 24.11.2001

The shelter of the tubes: tube sheltering in wartime London. John GREGG. Capital Transport Publishing: 96pp. 2001. ISBN: 1-85414-244-5 hardback. £ 16.95 + p/p from Capital Transport Publishing, 38 Long Elmes, HARROW WEALD. On sale at the British Library's bookshop, and at the London Transport Museum bookshop

Describes the use of underground railway stations in London as air-raid shelters during World War II, based on original official documentation, and personal diaries.

Numerous black and white photographs show the interiors of stations, and shelters, and alternative air raid shelter options. Other illustrations include reproduction of contemporary notices and official documents. There is also some information on flood defence works, the deep tunnel shelters, the use of a new but unopened Central Line extension as an underground factory, and bomb damage to tubes (with attendant casualties) at Balham, Bank, and Trafalgar Square.

There is a two page chronology of 80 events at tube station shelters between 7 September 1940 and 18 June 1945, two

pages listing primary sources, and five pages of supplementary notes.

P. W. SOWAN 23.3.2002

Catacombs: general guide. Brigitte de MONTCLOS and Jean-Pierre WILLESME. Paris: Musees de Ville de la Paris: 32pp. 1994. ISBN: 2-87900-166-8. From: Service des Visites, Catacombs de Paris, 1 place Denfert-Rochereau, 75014 PARIS, France. 01-43-22-47-63

This is an illustrated guidebook available to persons visiting the Paris Catacombs. It describes the catacombs' origins as underground building-stone quarries, and subsequent use to house human skeletons exhumed from cemeteries around the old boundaries of Paris to allow for the expansion of the city.

It also provides information on the establishment of the Paris inspectorate of Quarries, and remedial works undertaken to protect the city from subsidence.

Paul W. SOWAN 10.2.2002

Underground mythology. Sylvia B. BEAMON (EDITOR). Knebworth: Able Publishing: (6) + 123 + (5) pages. 2002. ISBN: 1-903607-20-5. £ 15.99 + £2.25 p/p from Mrs. S.P. Beamon, 2 Morton Street, ROYSTON, Herts SG8 7A. 01763-242120.

sylvia@salisburyvillas.freeserve.co.uk

Contents page/list of illustrations with credits
Underground mythology: introduction (1 - 6)

HASLAM, Ruby M. - The Shell Grotto at Margate (7 - 45)

OSBORNE, Bruce E. - Exploring water in underground mythology (46 - 63_

Introduction to the Czech Republic contributions (64 - 65)

MATOUSEK, Václav - Post-Mesolithic finds from the Bohemian Karst region and the exploitation of caves in the post-Mesolithic development of central Europe (Summary) (66 -68)

MATOUSEK, Václav - The motif of the cave in folk culture (69 - 77)

CILEK, Václav - Cave of the nymphs - archaic mind, and the symbol of a cave (examples from Czech Republic) (78 - 91)

BEAMON, Sylvia P. - Who, or what were the Knockers or the Knackers? (92 - 106)

BLACK, MC - Mithraism - a 'subterranean' religion (107 - 113). Reprinted from Bull. Subterranea Britannica 28 (1992). 16-20.

Conclusions (114-115)

Selective Glossary (116-123)

Index (124-128)

Paul W. SOWAN 2.6.2002

Caves and tunnels in South East England. Part 15.. Publication details: Records Chelsea Speleological Society 27 I Research Report Kent Underground Research Group for 2001: iv + 62pp. Harry PEARMAN Edr. 2002. £ 5.50 incl. p/p from Dr. A.R. Farrant (CSS Records), co British Geological Survey, Nicker Hill, Keyworth, Nottingham NG12 5GG.

This issue contains the following main articles:

Somewhere in the Home Counties (pages 1 - 3 and 6). Modern 'recreational' excavations of tunnels in chalk]

The Wilderness, Hargate Forest, Sussex - bunker (8 - 20). By Ian Todd: results of enquiries

concerning the history of this underground WWII structure]

South East group Emergency Centre, Lunham Road, London (20 - 23) South East group Emergency Centre, Lunham Road, London (20 - 23)

South East group Emergency Centre, Lunham Road, London (20 - 23)

'Paddock', London - bunker (27, 29 and 30 - 31). Alternative Cabinet War Rooms at Dollis Hill descriptions and plans]

High Street, S. Peters, Kent - chalk mine (30, 32 - 33, and 34). By Rod le Gear. Plan included]

Hartley, Kent - chalk well (33 and 36). By Mike Clinch]

Albion Road, St. Peters, Kent - chalk mine (35 - 36). By Paul Thorne; Includes plan]

Snape Wood, Wadhurst, Sussex - iron mine (37 - 39) 19th century ironstone mine -includes sketch map, plan and section]

Fort Borstal, Chatham, Kent (39 - 41). Includes plan of tunnels.

Gravesend ice well (42-44). By Rod Le Gear. Includes plan and section.

Additionally, there are numerous notes on collapses, deneholes, a 'notes and queries' section and extracts from more or less obscure publications.

Paul W. SOWAN 10.6.2002

London visits. The Newcomen Bulletin 181 (Dec. 2001), 31 - 32. From The Newcomen Society, c/o The Science Museum, London

This note describes a group visit to Aldwych underground station, disused since 1993, with historical details and

some technical data concerning the surface building, lifts, and running tunnels to Holborn.

Paul W. SOWAN 21.12.2002

The quarrying and distribution of Reigate stone in the Middle Ages. Tim TATTON-BROWN. *Medieval Archaeology* 45, 189 - 201. 2001

This paper seeks to identify a building-stone quarry noted in a charter of 1218 with a specific plot of land in Reigate parish Surrey, and further to identify this 'earliest documented quarry' as an openwork rather than an underground quarry, claiming that 'this must be the location' and that the charter indicates that this 'was, at least initially, to be a new surface one' (i.e. openwork quarry) although the wording of the document is not cited in the original or in translation, and the line of reasoning from the manuscript to its interpretation is not made clear.

The absence of the Upper Greensand escarpment at this proposed quarry location is, it is suggested, a result of the stone all being quarried away in the supposed open quarry, although it is admitted that there may be a geological reason for the absence of this geomorphologic feature. In the present reviewer's opinion, the removal of the rather low proportion of usable building-stone at this location by open quarrying would not have left the land surface so lowered and so evidently free of disturbed ground and quarry spoil.

The author seeks to interpret the scanty available evidence, especially that relating to the quarries, in terms of early opencast quarrying in Reigate parish, followed by later medieval underground quarrying on a greater scale in Merstham and pre-1933 Chaldon parishes. That opencast quarrying on a small scale might well precede underground quarrying seems a rational hypothesis, although there are

sound geological reasons in the case of Reigate stone to do with periglacial free-thaw cycles in the Quaternary, and the mass movement and fracturing of the stone beds at outcrop immediately above mobile Gault Clay in the Upper Greensand escarpment, why worthwhile stone was probably never at any time found or worked other than below a considerable overburden of worthless material. Again, from an entirely theoretical standpoint, the Chaldon and Merstham quarries, being closer to London than those at Reigate, and having a less formidable barrier to be surmounted en route to London in the form of a lower Chalk escarpment, might be expected to have been exploited first. What is known about the soil in the Merstham gap, however, from the excavation of a cutting for the Croydon, Merstham and Godstone Iron Railway in 1805, suggests this was probably not the route to London for Merstham stone, as does what is known about the quarries themselves.

The author's brief visit to the Chaldon quarries (with the writer of this notice) has, inexplicably, left him with an impression of vertical shaft entrances to the extensive underground quarries, whereas especially at Bedlams Bank, the original form of the quarry entrances can readily be seen to have been of 'pit and drift' form, with inclined planes leading from the drift entrances and pit floors to the general level of the surrounding land. The author's figure 4 shows an imagined 'crane and windlass' for raising stone vertically from the entrance pits, although he states clearly and correctly that there has been minimal archaeological investigation of those pits. There is in (fact no archaeological evidence for their ever having been equipped as shown!

Suggestions are made concerning the possible routes taken by stone from quarries to the Thames-side wharfs. And the paper likewise seeks to identify a Thames-side stone storage wharf noted in

a 1218 charter with a specific site in Battersea, although as he says there is so far no confirmatory archaeological evidence.

If substantiated by archaeological evidence, the identification of specific quarry and wharf sites is important. But the paper contains a minimum of archaeological observation, and a liberal use of the phrase 'must have' and, to this writer's mind, an over-liberal measure of not thoroughly substantiated interpretation. It is however an important and welcome contribution, in drawing attention to the lack of and need for serious archaeological investigation of quarry sites, transport routes, and storage wharves for this important medieval industry.

Paul W. SOWAN 20.12.2001

Collapse of the A2 road at Blackheath Road.

The road collapse at Blackheath this year is said to have created a pit 9m across. Since it is on the A2 it has caused considerable local anguish causing the Mayor of London, Ken Livingstone, to take an interest. Locals believe it to be the result of forgotten chalk caverns collapsing but this is doubted by Neil Rhind writing in Meridian History which is published by Greenwich Council. He points out that there is a history of unexplained collapses in the Blackheath tertiary beds, which do not involve the underlying chalk.

Nevertheless chalk was, in the past, extracted underground at the area known as the Point. William Steer started underground workings for burning lime in the 17th century. He was onto a good thing since lime was needed in quantity for the rebuilding of London after the Great Fire and his lime works were the nearest to London. However the lime was

of poor quality and Sir Christopher Wren for one refused to use it.

Chalk extraction ceased in around 1725 before which the Steer family was fined more than once for undermining local highways. By 1780 the mines were in use as a popular tourist attraction (the Blackheath Caves) and concerts and dances were held there. Unfortunately they were closed by the 1850s for safety reasons. They were reopened in 1938 and assessed for possible air raid shelter use but were deemed unsuitable and the entrances sealed with concrete.

Information for these notes was from: Meridian History, Greenwich Council, May 2002; Blackheath Guide May 2002; Westcombe News May 2002.

Manston Caves Kent

In the past chalk caverns at Manston in Kent were famous as visitor attractions. This is discussed in Kent Underground Research Group's Newsletter No73 June 2002. Mr. David Steel submitted snippets dated to 1871, 1830 from sources such as New Margate and Ramsgate guide and Beauties of Thanet. The account of 1871 indicates that the caverns were dug for chalk and were once a popular place for picnics. However by 1871 parts of the cave had fallen in which was attributed to being dug too near to the surface.

The account of 1830 indicates that parts had fallen in even at that time and report the chalk was first dug 60 years previously. The cave system is described as three long passages with lateral communications. A 'benevolent yeoman' Mr. Troward was said to have dug it.

It is interesting to note even these early writers scoff at suggestions that the caverns were dug as places of refuge particularly from the Dan

Mr. Steer is of the opinion the site of these

caves lies within the boundary of airport which is famous for its Battle of Britain role. A quotation from: Eagle Day. The Battle of Britain. Richard Collier. Hodder and Stoughton, 1966 may have some relevance.

'At Manston, on the Kent Coast, the morale of many was at its lowest ebb, their officers' example not withstanding; for six days many airmen had not ventured from the deep chalk shelters...

Only today Flight Lieutenant Dennis Armitage had spent a dusty half-hour groping through the labyrinth of caves vainly seeking a station electrician he had entrusted to complete a job.

'Secrets of the BBC bunker revealed

The BBC bunker, deep in the bowels of Broadcasting House, is open to BBC visitors this week. Its 10,000 tons of concrete were designed to withstand, first Hitler's bombs, then nuclear attack, making sure that no matter what, the BBC stayed on air.

It was the bomb that scored a direct hit on BH in 1940 that prompted the BBC to make contingency plans. The secret bunker was built at lower ground level on land the BBC owned at the rear of the original building, then the site of a planned extension in the style of the existing Broadcasting House.

Five feet thick walls and a ten feet thick roof protect a self-contained broadcasting centre with its own power supply to serve four small radio studios, beds and food supplies. The steel doors are fitted with seals to withstand a gas attack, and the ventilation system includes a gas filtration unit.

The war ended, but the bunker was maintained for another 40 years, throughout the Cold War (1945 to 1992) re-equipped periodically to keep up with advances in technology.

Since 1992 it has been used for storage of furniture and redundant broadcasting kit, remaining a well-kept secret, even to Broadcasting House's longest serving occupants. The Director of radio and music only discovered its existence three weeks ago.

Post Cold War, the BBC doesn't need the same bunker mentality. These days, its back-up, in the event of fire or flood at a main broadcast centre, consists of facilities in other BBC buildings.

To visit the bunker, take the escalator to the second floor, turn left at the snack bar, then take the lift to lower ground and follow the bunker signs.'

There is a short item in the latest issue of Prospero (newspaper for retired BBC staff) about the BBC bunker at Broadcasting House. It was open for a week to celebrate the 70th anniversary of Broadcasting House

Martin Bay

JOSEPH DICKINSON, INSPECTOR OF MINES, AND HIS REPORT ON MINES IN SURREY

Joseph Dickinson 1818 - 1912 was born at Newcastle-upon-Tyne on 24 November 1818, and from 1840 was employed at the Dowlais Ironworks and Mines, and from 1847 at the Nithsdale Ironworks. He became a Fellow of the Geological Society in 1842. He was one of the four first Inspectors of Mines appointed under the Coal Mines Inspection Act, 1850, having at first responsibility for coal and ironstone mines in Lancashire, Cheshire, North Wales, Staffordshire, Shropshire, and Worcestershire.

In the 1870s and 1880s he was the author of various papers and reports on the brine wells, rocksalt mines, and associated ground subsidence problems in Cheshire.

On the passing of the Metalliferous Mines Regulation Act, 1872, all underground

minerals workings (including slate quarries, sand mines, and all other sorts of minerals, as well as metalliferous ores) came under government inspection and regulation - including the building-stone quarries and hearthstone mines in Surrey.

The mining inspection districts were therefore reorganised, and those counties without coal or ironstone mines catered for. Surrey was appended to Joseph Dickinson's newly created Manchester and Ireland Inspection District! However, he took little notice of Surrey until 1886 (14 years after the Act), when he included a short report, reprinted here, in his official Report for that year. Possibly the much-advertised Sub-Wealden Borehole at Brightling (Sussex) and subsequent opening of a new deep shaft gypsum mine there in or about 1875 was responsible for drawing him away, briefly, from the many more numerous and larger mines in the main part of his Manchester and Ireland inspection district?

MINES IN SURREY

Several of the counties in England where mines were not worked, or where working was only on a small scale, having only recently been apportioned to the districts, the mines in Surrey have hitherto not been included in the lists, although some of them have been worked since a date long before the passing of the Mining Acts. The geological position of these mines is below the chalk-marl, being in what are called the Firestone, the Gault, and the Lower Greensand. The uppermost, in the Firestone, are worked for stone called hearthstone, which is used for rubbing hearths, &c., and for firestone, used for backs of grates, glass works, &c. The next are those in which fullers earth is worked. The lowest in the series are where sand is worked, the sand which is at present being worked by mining is called silver or silver-white sand.

The hearthstone and firestone have been extensively worked by mining at Whitehill,

east of Merstham and Bletchingley, besides explorations at other places, and there are at present workings at Godstone Hill, between Caterham and Godstone. These later workings extend about 500 yards underground, the entrances being drifts from the surface. The system of work is by pillar and stall or stoop and room. The stalls or rooms are from 2.5 to 4.5 yards wide, and the pillars or stoops are of various shapes and sizes, averaging from about 8 feet square to 8 feet by 12 feet. The dip varies, the average being about 1 in 12, and the water from the dip workings passes slowly away by percolation or occasionally through crevices which occur in the rock. The height of the workings is about six feet, the upper part being hearthstone and the lower part firestone. The face of the work is advanced by holing next the roof, the holing is only a few inches in height, but is made nearly two yards underneath. Below the holing the hearthstone is taken up, and after it the firestone. Picks, double-axes, long holing rods and wedges are used, but no powder. There are some tramways, but most of the stone is either dragged on the floor by horses, or wheeled out in barrows.

The roof is generally strong, but at a few places where it is not sound wooden props and couplings are set underneath. The hard roof-stone is about 15 inches in thickness, and over it is a green bed four to five feet in thickness, and above that there is a varying thickness from a few inches to, say, 20 or 30 yards up to the chalk-marl. At an exploration about a mile north-west of Reigate, the green bed is close under the chalk-marl. The mines are moist with scarcely any dust. The frequent cuttings through, called eyes, together with the crevices in the rock, afford generally good air, and the men look healthy. Plans or maps do not appear to be kept of the workings, and as the number of persons employed does not exceed the specified 12, plans are not imperative under the Metalliferous Mines

Act, which Act these mines come under. Besides the mining, these stones with building stone underneath are worked by quarrying.

The fullers earth workings are by windlass pit 18 yards deep at Cockley, and by drifts from the surface at Park, near Nutfield. At Cockley, where mining has been in operation for some years, passages are driven about seven yards wide and about six yards high, and as the ground is soft large pillars two or three times the width of the passages are being left. Couplings, consisting of a pair of props with a connecting head tree, are set in the middle of the passages, and instead of waggoning the earth is wheeled out in barrows.

There workings are advanced by holing or driving about 4 feet high next the roof, which admits of the roof being dressed when there is ready access to it, the stuff thus got in the holing being waste, the fullers earth, five yards thick, being taken up underneath. Some of the fullers earth is sent off undressed and some is dried in kilns and after being crushed into powder is then separated in wooden chambers by air currents caused by fan blast. Besides the mining, fullers earth is worked open cast in the neighbourhood. The sand has been mined at various places, and one side of the town of Reigate is said to be honeycombed. The present mine is close to the town of Godstone. The entrance is by drifts from the surface, the passages being driven narrow with the upper part in arched form, like cloisters. Besides the mining, there are open cast workings on various kinds of sand.

Dickinson retired as a mines inspector on 31 December 1891, having served in that capacity for 41 years. He died on 27 April 1912, aged 93.

DICKINSON, Joseph, 1887, Mines in Surrey, Report of H.M. Inspector of Mines.. Manchester & Ireland District., for 1886, 24 - 25.

Paul W. SOWAN

GATTON TOWER WOOD QUARRY

(TQ 27355320) REOPENED:

FURTHER RESULTS FROM THE REIGATE STONE RESEARCH PROJECT

The Reigate Stone Research Project

The writer has been collaborating with Historic Royal Palaces in making a study of Reigate stone in connection with the conservation of this material in the fabric of the Tower of London and Hampton Court.

The research project has involved taking diamond-drilled core samples of stone from the several beds in the underground quarries, for scientific analysis. Reigate stone is a unique British building stone, the most important constituent of which is a peculiar form of chemically precipitated cristobalite (silica), so technically neither a sandstone nor a limestone, nor an intermediate between the two. Established stone treatment methods for limestones and sandstone are, therefore, not necessarily appropriate or effective for Reigate stone. The project has been described in Surrey Industrial History Group Newsletter 110 (1999), and Surrey Archaeological Society Bulletin 335 (2000.) A first announcement of results of analyses of the mineral constitution or architectural sample has now appeared in Journal of Architectural Conservation 3 (2001.) Quarry samples analyses have not yet been published, but display similar variability.

Samples had already been taken in open and accessible quarries at Merstham, Blechingley, and Godstone. However, medieval quarrying is known to have been carried out, probably in Gatton and certainly in Reigate where, in 2000, no quarries remained open. It was decided to re-open Tower Wood underground quarry, Gatton, as the exact location and underground layout and condition of this working was known.

Historical background for Gatton quarries

Gatton is a small rural parish (and former 'rotten borough') in east Surrey, lying astride the Upper Greensand outcrop between Reigate and Merstham. As in almost all the eight or so parishes on the Upper Greensand from Brockham to Godstone, Gatton has had its share of underground mining and quarrying activity, and consequently of mining subsidence features. William More's building accounts for Loseley House (which was rebuilt 1561 - 1569) mention that stone was purchased from quarries at Gatton; and John Aubrey, writing in the late 17th century, specifically mentions underground quarries in the parish. An 18th century estate document notes a 'quarry field.' The extensive outbuildings of Gatton Hall and the tiny parish church are built of the local 'Reigate stone.'

Quarrying was evidently carried on in the 19th century. Gatton was amongst the 109 British quarries surveyed (published 1839) in the course of selecting stone for rebuilding the Houses of Parliament at Westminster after the fire in the 1830s (perhaps Lord Monson's position as Commissioner of Lands and Plantations ensured this?) And published mineral statistics in the 1850s indicate commercial quarrying, although this appears to have ceased by the 1870s when underground building-stone quarries became subject to inspection under the Metaliferous Mines Regulation Act, 1872. Gatton quarries do not feature in the published lists and inspection reports resulting from that Act.

Locating the quarries

The sparse documentary evidence, field walking, and occasional documented crown-hole collapses in Gatton (and immediately adjoining parts of neighbouring Merstham parish) point to one or two areas of certain underground quarrying alongside Gatton Bottom Road, and two more where this is probable. Most

of the undermined land is in or adjacent to Gatton Park, especially in the grounds of a residential school and a neighbouring golf course. Access to four small areas of quarry tunnels near Gatton Bottom Road has been possible, via temporary or accidental entrances, since the 1950s, although by 2000 all access was again sealed. Possibly all these small workings were once part of one or two large quarries, with intercommunication now impossible as a result of roof-falls.

Reopening Tower Wood quarry

It was decided to reopen Tower Wood quarry in Gatton, as the exact position and underground plan of this was known (it was last visited in the 1970s, when for example the writer assisted art historians from the British Museum in retrieving blocks of Reigate stone in connection with work on wall paintings from St. Stephen's Chapel rescued after the 1830s fire at the Palace of Westminster.) With the agreement of the school authorities, and funding from Historic Royal Palaces, and practical direction by the Wealden Cave and Mine Society (WCMS) a very large mechanical excavator was hired for a day. The quarry floor was known to be 7.4 metres below ground level, and the former crown-hole collapse was dug out to that depth, allowing access to the tunnels. A permanent access shaft of concrete rings was installed, and fitted with a locked manhole cover to protect access. It is a condition imposed by the school that this entrance should only be used out of term time, and by prior arrangement through WCMS. WCMS have extensive experience in exploring and recording the east Surrey mines and quarries, and in establishing secure entrances and maintaining access in liaison with landowners and occupiers.

The stone is so variable in composition that, in theory, matching stone in buildings to specific quarries should be possible. However, as to date quarries have been sampled at only six widely

spaced locations (up to seven beds at any one site) over a distance along the outcrop of over seven kilometres, there are currently no particularly good matches, and a far denser sampling grid, say every 100 metres, might be required to make this possible.

The Chaldon - Merstham quarry tunnels complex contains at least 17 kilometres of accessible tunnels, but would be exceedingly difficult to sample on this scale, if only on account of the practicalities of powering an electrically driven core sampling drill so far underground, and the cost of scientific analysis of samples retrieved.

Further work envisaged

As the main focus of medieval quarrying appears to have been in the Reigate - Merstham - Chaldon part of the Upper Greensand outcrop (with extraction east and west of this known or strongly suspected to be of relatively modern date), the Project Team would like to re-enter a Reigate quarry to take samples. However, apart from the Colley Hill hearthstone mine (stratigraphically too high, and known to be in an advanced state of collapse) no underground workings have been accessible so far as is known for over a century, and although some entrance and crown hole collapse locations are known accurately, nothing is known of the underground layouts or the conditions of the quarries. And much of the Upper Greensand outcrop in Reigate is under residential property, where examination by the Wealden Cave and Mine Society tends to be welcomed only when collapses in well-manicured lawns or near expensive houses occur! However, one possible 'greenfield' site known to have been in use in the mid-19th century has been identified, and discussions opened with the occupier. Whether attempts will be made to re-enter this quarry will possibly depend on the progression and outcome of these discussions, and the availability of funding for the hire of another excavating

machine for a day (several hundred pounds.)

Another possibility under consideration has been the location and descent of a well near Colley Hill which has been recorded as having broken through ancient building-stone galleries (at a lower stratigraphic level than the hearthstone mine tunnels at that location.) This, in publicly accessible open space, would require negotiation with the National Trust, careful planning to avoid damage to an important botanical site, and elaborate measures to ensure public safety (although exact location of the well and an examination of its condition might be thought to be an important safety question in its own right - possibly inadequately capped wells on publicly accessible land call for appropriate safety precautions!) There have, too, been one or two small crown hole collapses in the immediate area in recent years, so an examination of the ground here could be justified on health and safety grounds anyway, with the possibility of archaeologically valuable information being gathered at the same time. This option is not at present under active consideration.

Sketch-plan

A sketch plan of Tower Wood quarry, Gatton, was made by R.P.Shaw in the 1970s, and was published in Proceedings of the Geologists' Association 86(4)(I 976), page 577. The entrance shown, at a crown-hole collapse, was reopened in August 2000. The narrow tunnel at the south end is the (blocked) original entrance. The entrance is locked, and visits to the quarry should be arranged with Wealden Cave and Mine Society, in liaison with the school authorities, in school holidays only. Unauthorised persons in the residential school grounds can expect intensive investigation by the police.

Paul W SOWAN

Follies and Grottoes and Rock Houses

Follies Autumn 2001, Volume 13, No. 2, Issue 50 refers to rock houses in a sandstone outcrop at Quatford in Shropshire. These are attributed to the Reverend Higgs, vicar of Quatford Church from 1695 to 1763. The article in Follies gives a fairly full description of the present day ruins of these rock houses which are in private hands.

Follies, Spring 2002, Vol 13, No3, Issue 51 refers to Marsden Grotto, South Shields., Tyne and Wear which was closed in September 2000. This grotto was formed about 1782 by Jack the Blaster Bates a former lead miner seeking work in the Marsden limestone quarries. His use of dynamite earned him the title 'blaster'. The home he created in the cliff at Marsden became a local curiosity but was abandoned from his death in 1792 to 1820 when it was incorporated into an hotel and a subterranean ballroom was added. In 1938 an electric lift from the cliff-top down to the grotto was fitted. Recently new owners have completely remodelled the grotto.

Shire publications have now published (2001), Shell Houses and Grottos, 40pp, £4.50, ISBN 0 7478 0522 9 The reviewer in Follies recommends it.

Follies Autumn 2002, Volume 14, No. 2 Issue 53 contains an article: Who Didn't Build the Margate Grotto by Mike Cousins. The problem with the Grotto is that no-one knows who built it and it remains an intriguing mystery. However good document research by the author rules out Lady Holland, Caroline Fox, (nee Lennox) in the 18th century.. The author also refers to a now lost additional Margate's High Street 'Grotto House' and to a shell grotto at Goodwood., Sussex.

CAVES, CAIRNS, TUNNELS, PASSAGES AND PITS, Part 2

Being the précis of second installment of a review of underground monuments protected by Historic Scotland either by scheduling, listing or taking into guardianship. The précis of Part 1 appeared in Newsletter 24. The original article is by John Crae in The Grampian Speleological Group Bulletin, Fourth Series, Vol 1, No.1, October 2001.

Craigmillar Castle, tunnel to Peffermill House and Inch House. (NT 283705 — NT 291710)

There are reliable accounts tunnels (one in the castle kitchen) natural caverns and mines at this site but none are now accessible.

Crawley Tunnel. (NT 260725 — NT 265738)

This is one of the early water supply tunnels feeding the old town of Edinburgh

can be entered from near Heriot's School and runs under the Grassmarket to below the Royal Mile. Branches go under Heriot's School, up the Royal Mile to a small reservoir at the top of Castlehill and down to the Mound. It belongs to East of Scotland Water, who is anxious to maintain it.

Inchcolm. Island, wartime fortifications. (NT 189826)

The island contains the ruins of defences built during both World Wars. During World War I the island formed part of the Middle Line of defence for the dockyards at Rosyth, It was fortified with eight 12 pound naval guns later increased to 6

inch breech loaders, four 4 inch quick firers and four 4.7 inch quick firers the concrete aprons for which can be seen at the west of the island. Guns and ammunition were transported by narrow gauge railway and there was a tunnel constructed for troops to move from their barracks on the west of the island to the batteries on the east.

Edinburgh Castle, Fire Access Tunnel. (NT 249734 — NT254736)

Built in 1990 the fire access tunnel at Edinburgh Castle) was cut into what was assumed to be the solid volcanic plug below the castle. It is not for the public but for fire appliances

Scottish Parliament, Tunnels below the Site. (NT 269739)

The area now being transformed into the Scottish Parliament has a long history associated largely with the brewing and distilling of alcohol. A number of wells supplied by a the site. These were linked at low level by a series of tunnels or mines. The wells have been filled but the tunnels presumably remain albeit totally flooded

Scotland Street Tunnel. (NT 255738 — NT 255755)

At one time this was a major route connecting the centre of Edinburgh with the ports of Granton, Newhaven and Leith. The railway tunnel owned by the Edinburgh Leith and Newhaven Railway can now only be entered either through a locked gate off platform 20 of Waverley Station or from a similarly locked gate in King George V Park in Canonmills. . It was closed in 1868. It is still possible to walk with special permission is required from both Edinburgh Council who own the tunnel and .Railtrack who own the station.

Stirling Castle, Access Road under Courtyard. (NS 788941 — NS 792938)

There is a recently restored Great Hall at Stirling Castle. Until 1995 the building was in use as an army barracks and was greatly altered.. Beneath the hall are the vaults and chambers originally used as kitchens and larders. Along the courtyard side of these vaults is an access road complete with cobbled surfaces and drains

Innocent Railway, Tunnel (NT 270735 — NT 275725)

The Innocent Railway was designed and opened in 1831 to provide a route for coal travelling to the St Leonards depot in Edinburgh from pits at Newton near Dalkeith. It was one of the earliest of railway companies and the line was run with teams of specially trained horses and a few open waggons on 4'6" gauge track. The tunnel which has a steep gradient was controlled with a system which counterbalanced trains travelling in opposite directions. The line was closed in 1968 and was little used until 1981 when it was paved and used as a cycle path. and now forms part of the National Cycle Network, although there is no cycling allowed in the tunnel which is 510m long..

Stanley Mills, Mill Lade. (NO 11.5325 — NO 115330)

At this site, north of Perth a mile long tunnel cuts off a loop of the River Tay to supply the mile long 1921 Hydro-Electric Power Station There are three other tunnels constructed in 1729 and 1785, supply water to the mill lade.

Prospect Dill Canal Tunnel. (NS 880791- NS 885782)

Scotland's first and until recently only canal tunnel passes under Prospect Hill now on the south-western outskirts of Falkirk. It was closed in 1963. Further north the Edinburgh to Glasgow Railway passes through the hill in its own tunnel.. Between the two tunnels was a mine which is now disused and the land converted to playing fields.

Pit Prisons

Most often located in the gatehouses, the best defended parts of castles, pit prisons were the places where prisoners were sent if they were to be forgotten. The extremely

hierarchical nature of feudal society extended even to prisons with noblemen usually housed in the upper floor. Common prisoners were housed on the lower floors and only the most dangerous prisoners were condemned to the pit.

Blackness Castle. (NT 055803)

The pit prison would flood at high tide when the waters of the Forth would flood into the pit through the latrine.

Dundonald Castle. (NS 363345)

In the village of Dundonald on the A71, 12 miles from Ayr and five from Kilmarnock. It date to 1390 is in the care of Historic Scotland and is managed by the Friends of Dundonald Castle. The pit prison is a small vaulted room entered through a hatch from above.

Rothesay Castle. (NS 088645)

The pit prison at .Rothesay Castle sits within the gatehouse of the castle, which was started during the reign of James VI The prison consists of a low vaulted room with a latrine emptying into the moat. it is entered down a hatch from the pend or entrance to the castle

St. Andrews Castle, Bottle Dungeon. (NO 512169)

The bottle dungeon in the Sea Tower of St. Andrews is infamous as the worst of the pit prisons.

Burials

Although burial cairns were common across most of Scotland only a few remained well enough preserved to merit protection. Most of these are in remote or sparsely populated locations. The largest

concentration of well preserved cairns is in the Orkney Islands.

These cairns, constructed in stone, were centres of religious life for the Neolithic people of Scotland.

Blackhammer Chambered Cairn. (HY 414276)

This is a seven compartment cairn on the south coast of the island of Rousay in the Orkney Islands.

Cairn Holy Chambered Cairns. (NX 518540 & NX 517538)

Two chambered cairns now open to the elements illustrate the differing construction techniques used by Neolithic tomb builders.

Cairn O' Get. (ND 313411)

This is in moorland 100 yards east of Broughwhin, 580 yards west of the west shore of Loch Watenan and 520 yards west-south-west of Watenan, a track leads up from the village of Swiney to the south, of Lybster on the A9. The cairn is the only scheduled monument in a group of cairns, turnulii, standing stones and forts to the west of Loch Waternan, a hill fort on Garrywhin. It is in the guardianship of Historic Scotland

Clava Cairns. (NH 752439 — NH 760445)

A group individual monuments at Balnauran of Clava form a linear cemetery. As each tomb is no longer used for a group of people a new cairn had to be built for each burial.. The chambers are small and undivided. The three largest tombs are aligned on the mid-winter sunset to the south-west and the standing stones are graded with the largest at the south-west and the smallest to the north-east. Several of the stones are marked with cup and ring symbols, the meaning of which is unknown.

Cairnpapple. (NS 917787)

This cairn at Cairnpapple is the product of 3000 years of ritual on the site. It is associated with cremated human remains (3000-2500 BC), and an oval of standing stones or henge. were cut into the underlying bedrock around the cairn. The chamber of the cairn can be entered through a hatch in the roof The site was excavated in 1947 and 1948 and is the property of the Scottish Ministers, in the care of Historic Scotland scheduled Monument 90268].

Cuween Hill (HY 364128)

On the Orkney Islands, overlooking the Bay of Firth, the tomb is entered by a narrow passage 5.5m long, 0.7m wide and 0.8m high. The outer part is unroofed, but 3m is still roofed with stone slabs. The masonry of the inner chamber is of high quality forming an approximately rectangular space 2.3m high with a modern roof. Smaller chambers open off the central space.

Dwarfie Stane (HY 244005)

On the Orkney Islands between Quoys and Rackwick, the Dwarfie Stane is composed of a short passage with small cells on either side leads from an entrance on the west side into the stone.

Kilmartin Glen, Nether Largie Cairns (NR 826979)

Site between of Kilmartin between Oban and Lochgilphead on the A816 The linear cemetery in Kilmartin Glen includes a collection of Neolithic and Bronze Age monuments. A centre chamber is now open but would originally have been roofed and reached by a passage now buried in the later mound.

Grey Cairns of Camster (ND 260441)

South west of Wick and five miles north of Lybster and West Clyth, Neolithic cairns

are signposted from the A9. The two large chambered burial cairns are of Neolithic date. They have been restored and fitted with lights. They are amongst the earliest monuments in Scotland and probably dating from about 3500 BC,

Quoyness (NY 676478)

Burial chamber on the island in the Orkneys. The entrance is on the south-east side of the cairn and opens into a chamber 4.1m by 2m with walls standing 4m high. The mound of the cairn is 20.4m by 17m and 4.3m high and stands on an irregular raised platform.

Maes Howe (HY 318128)

This burial chamber is on the mainland of Orkney, approximately nine miles west of Kirkwall, off the A965, Maes Howe is a large mound, containing an entrance passage and burial chamber with cells in the walls. Built around 5000 BC and is older than the pyramids of Egypt and considered the finest chambered tomb in north-west Europe. It was built around 5000 BC and is older than the pyramids of Egypt. It is in the care of Historic Scotland and its predecessors since 1910. Admission, shop and refreshments at the nearby 19th century Tomiston Mill scheduled Monument 90209].

Knowes of Yarso (HY 404279)

This burial chamber held the remains of The 29 individuals mostly in the main compartment it is to be found on the south coast of the island of Rousay

Taversoe Tuick, Chambered Cairn (HY 426276)

This cairn, located on the island of Rousay, 200m west of Trumland, north of the B9064, is unusual in being built on two levels. 90297].

Knowe of Unstan or Onstan, Chambered Cairn (HY 282117)

On Orkney about 4km northeast of Stromness on the A 965 to Kirkwall, the concrete roof now over the remains of the chambered cairn gives a good impression of the original mound which had a subdivided central compartment. Pottery excavated in 1884 is now known as Unstan Ware.

Holm of Papa Westray (HY 509518)

A small island to the west of Papa Westray and separated from it by the Bay of South Wick, Holm of Papa Westray is topped by the chambered cairn on its highest point. This cairn, 35m long and 16.8m wide is similar to the more famous Maes Howe. It is now covered by a concrete roof with a hatch to allow access to visitors

Wideford (HY 409121)

Located on the flank of Wideford Hill, four km west of Kirkwall in the Orkneys, Wideford Chambered Cairn] is an almost circular mound of stones Three smaller chambers open off the main chamber.

Midhowe, Chambered Cairn, Rousay (HY 372304)

On the west coast of the island of Rousay, two km from Westness pier and eight km from Trumland pier, this chambered cairn with Midhowe Broth (HY 37108) Now covered by a modern building to protect its stonework

Mines

Birsley Brae, Medieval Coal Mine (NT 392728)

Part of the estates of Prestongrange

Corrantee Lead Mine (NM 798660 — NM 804659)

The underground workings and associated surface remains held by the Scottish Ministers and administered by the Scottish Office Agriculture and Fisheries

Department.

Creag Madaidh Mor (NM 819001)

A disused copper mine west-north-west of Gienmoine. The surface remains include a store, house and two adits. The mine is owned by the Scottish Ministers and controlled by the Forestry Commission. [scheduled Monument 5490].

Fee Donald Lead Mine (NM 857660 — NM 863667)

Also known as Bellsgrove Lead Mines in Alit Feith Dhomhnuill in Sunart. Underground working and the associated surface feature remain. In private ownership.

Inverarrish Ironstone Mine (NO 553340 — NO 569371)

Iron ore mine, kilns and associated remains, mine-head buildings, railways (now largely dismantled), mine-workings surface and subsurface including eight km of tunnels. There are also associated harbour facilities to the north-east of Suishnish Point on the south-west coast of the island of Raasay. Now controlled by the Scottish Ministers and administered by the Forestry Commission. The history of the mines on Raasay is described in detail in 'The Raasay iron mines: Where Enemies Became Friends' by Lawrence Draper, 1990. Associated with WWI. The mine closed on 31 March 1919.

Knockiebae Lead Mines (NX 188665)

The remains of these eighteenth and nineteenth century lead mines straddle the march dyke between Knockiebae and Barnshangan in the Parish of New Luce in Wigtonshire. The site includes a number of adits, mine shafts, spoil tips and buildings. now administered by the Earl of Stair's 1970 Trust, Estates Offices, Rephad, Stranraer, Wigtonshire

Précised By Paul W SOWAN

The Gros Ouvrage Hackenberg

I have just returned from a visit to the Maginot Line Fortress of Hackenberg and thought I would write a short note to help others who were planning a trip. My comments are more of a practical nature as you will see. I cannot improve on the excellent work done by Dan McKenzie, Nick Catford and others and I strongly suggest you check their websites before you travel.

Hackenberg is about 4 hours drive from Calais on the Auto route. Your UK credit card will work in the Auto route toll booths. The forts location is approximately 15km east of Thionville. There are plenty of Comfort Inn type hotels in Thionville and Metz.

The nearest bars to the fort are a café in Veckring, another in Helling, another in Buding.

The Fort is well signposted from the D918 from Thionville to Saarlouis.

If you come along the D2 from Koenigsmacker look on the left as you enter the village of Cite des Officiers. These are the houses for the officers who were attached to the maginot Line in the area. Follow the signs to Ouvrage Le Hackenberg and turn left by the tank in Veckring.

Opening times August 1500 each day (definitely open on Wednesdays) September 1400 and 1800 on Sunday only. You are strongly advised to check the times by phone on 00 33 382 8230 08

you will need a jumper as the temperature is a constant 12 centigrade. Trainers are fine but sandals might mean wet and sticky feet.

Get there about 14.20 and wait on the bridge by the munitions entrance (the one with the rail tracks in the concrete). If it's crowded you may

not get on the first tour so get to the front and hold your place. The tour costs 5€ per adult and takes 2.5 hours. The commentary is in French though they will give you an English crib sheet.

Tours can be arranged in English for larger groups by prior appointment.

The tour takes you through the Munitions entrance. Between the grilled doors and the first set of blast doors note the floor is designed to slide away into a side room. The rail tracks and its supporting structure slide across to make an attack on the fort more difficult.

You then walk to the main Magazine M1. Note the machine gun openings at bends in the corridor. The first bay in M1 has a display of munitions on the left. The guide will start waving about pointing at the ceiling. The black charring and pockmarks in the surface are where the Germans blew up their munitions in late 1944. In the corridor between M1 and the barracks area, you will see a heavy blast



Hackenberg - Munitions Entrance Photo Dan McKenzie

door that is bent at the bottom. It was designed to fit over the frame rather than in it, and should be closed when under attack, so an explosion in M1 would not send a blast through to the working casemates. The door frame was cut back in the bottom left corner in early 1944 so the engineering machinery could be brought in. When the Germans blew up the munitions in M1 in late '44, the door slammed shut and being unsupported in one corner was bent by the blast. Then the tour proceeds on to the Kitchens, Power station, officers dormitory (currently a small museum), the men's dorms (the museum with all the rifles on the wall and handguns in glass cases) and back into the main corridor. You then take a train ride to block B9. View the working turret; check out the single heavy mortar, then outside through the emergency exit to view the casemate B9 from outside. It is interesting to note how the blocks all protected each other by covering arcs of fire.

Then a short walk to block B8, returning to B9 for the train ride back to the start.

Guide books in English for the Hackenberg Fort, are on sale at about 5 € and a more complete book on the Maginot line at about 30€. There are no videos for sale.

Refreshments are sometimes for sale at a small kiosk outside the entrance to the fort, I suggest you try some of the home made cakes.

Some dates may help put some of the detail in context. Hackenberg was completed in 1935. It was formerly going to be two large forts Hackenberg east and west, but due to financial constraints it was decided to drive a 1km tunnel to blocks 1,2,4,5,6,21 and 22 thus creating one of the largest forts on the Maginot Line. It was surrendered to the Germans in July 1940. Early in 1944 the German Klockner-Humbolt-Deutz Company converted the M1 magazine and the dormitories for the manufacture of engineering parts, moving out in August 1944. The German army then stored munitions and equipment in M1 magazine until 1944, faced by the advancing US troops the Germans blew up the

remaining munitions stored in the M1 magazine and abandoned the fort. The fort was retained by the French Army until 1970. In 1975 it was opened to the public by the Association AMIFORT – Veckring.

There is also an extended walking tour which gives access to the casemates from the outside, if you get there early morning it is probably a good way to extend your visit. Check the map at the Munitions entrance car park. I suggest you take the car from the munitions entrance in the direction of the exit. At the men's entrance follow the sign to Chapelle (left) and keep going up the hill until you get to the top of the hill. The road is passable for normal cars. The blocks either side of the Chapel are observation blocks 11 and 12. From block 12 (farthest from car Park) you can follow the signed path down to the main casemates in Block 24, 10, 8, 9, 25 and 7. On leaving you have to follow the one way from the Men's entrance down to Veckring turn right at the main road.

Along on the left you will see the old fortified barracks for Hackenberg, now used for paintballing.

IMPORTANT SAFETY INFORMATION

- There are plenty of trip hazards and slippery areas so take care. Keep your hands and head well inside the open carriages of the train at all times.
- There are some very very narrow points on the train ride where it passes through blast doors in the tunnel from barracks to casemates.
- Where there are overhead wires for the train they carry 600volts DC. frankly they are low enough to be a real hazard.

It is a very good visit and well worth the effort, for those travelling on toward Strasbourg the fort at Maginot Line Fort at Simserhof is open from 1000 to 1800 every day in August and 1000 to 1700 each day from September to November 15th. It costs 8 € and again there is no English commentary.

Source Ian Davidson

Eastwall / Ostwall

The underground complex of the Miedzyrzecz Fortified Front, or Eastwall as we in the UK call it, is an unequalled monument of military architecture of the 20th century in Poland and one of the most interesting in Europe.

The underground complex of the Miedzyrzecz Fortified Front, or Eastwall as we in the UK call it, is an unequalled monument of military architecture of the 20th century in Poland and one of the most interesting in Europe. Located in between the Odra and Warta rivers, running north to south and lying just west of Swierzyna, Miedzyrzecz and Swiebodzin, the Eastwall is of great interest to many of us. The history of its construction, the architecture of its defensive fortifications, and the present state of the fortifications are commented on below.

The Eastwall started life sited just inside Germany on its then border with Poland. After WW2, it was part of Poland – about 70km inside the country...

In accordance with their military doctrine after World War I, the Germans assumed France to be the first enemy in the next war. Germany had to then think about preventing a costly two-fronted war. So fortification work on the eastern border started in 1932, as a result of the crisis in political relationships with Poland. As early as in 1933 fortifications were built in Eastern Prussia, Pomerania and Silesia.

The idea was to protect Berlin from attack from the east. So it was decided to provisionally close the so-called Lubuska Gateway using a 'Line of Obstacles' from Nischlitz (now Nieslysz) to the Obra River. It was agreed that the system of obstacles would consist of canals connecting lakes, and defensive fortifications at the most important road crossings. In 1934-1935, 12 fortifications were built of C- class resistance, commonly known as Hindenburgstand, and officially called MG-Schartenstand und Pak-Unterstellraum.

In the summer of 1935, it was decided to reinforce the obstacles of this defensive line with bunkers of B and B1 resistance class, which would sustain the fire of the

then Polish artillery. Such constructions were situated mainly at main roads. Thirteen such fortifications were built by the beginning of 1936.

In May 1935 the ultimate design of the fortifications that would close the Lubuska Gateway were finished. The plan was based on the concept of a Fortified Front. It was presented to the Operation Squad of the General Staff, but Adolf Hitler, the Chief of the German Military Forces, was to decide about its implementation. On October 30th 1935, Hitler accompanied by officers from the Wehrmacht High Command inspected the construction of fortification no 516 (775) in Wysoka (formerly Hochwalde). Looking at an extensive panoramic view from the hill near Kalawa (formerly Kalau), he listened to the officers of the Inspectorate of Engineers and Fortifications who described to him the construction of the Eastwall constructed in part using an existing series of mine workings. In spite of the enormous costs expected, Hitler, fascinated by the project, accepted the plan of the Miedzyrzecz Fortified Front, i.e. Miedzyrzecz Fortified Region, or 'Eastwall'.

Preparatory work started in the spring 1936. Since the mid section between Staropole, Wysoka and Klszyca was the weakest point of the line - devoid of any serious water obstacles and large forested areas - it was decided that this section should have the strongest fortifications.

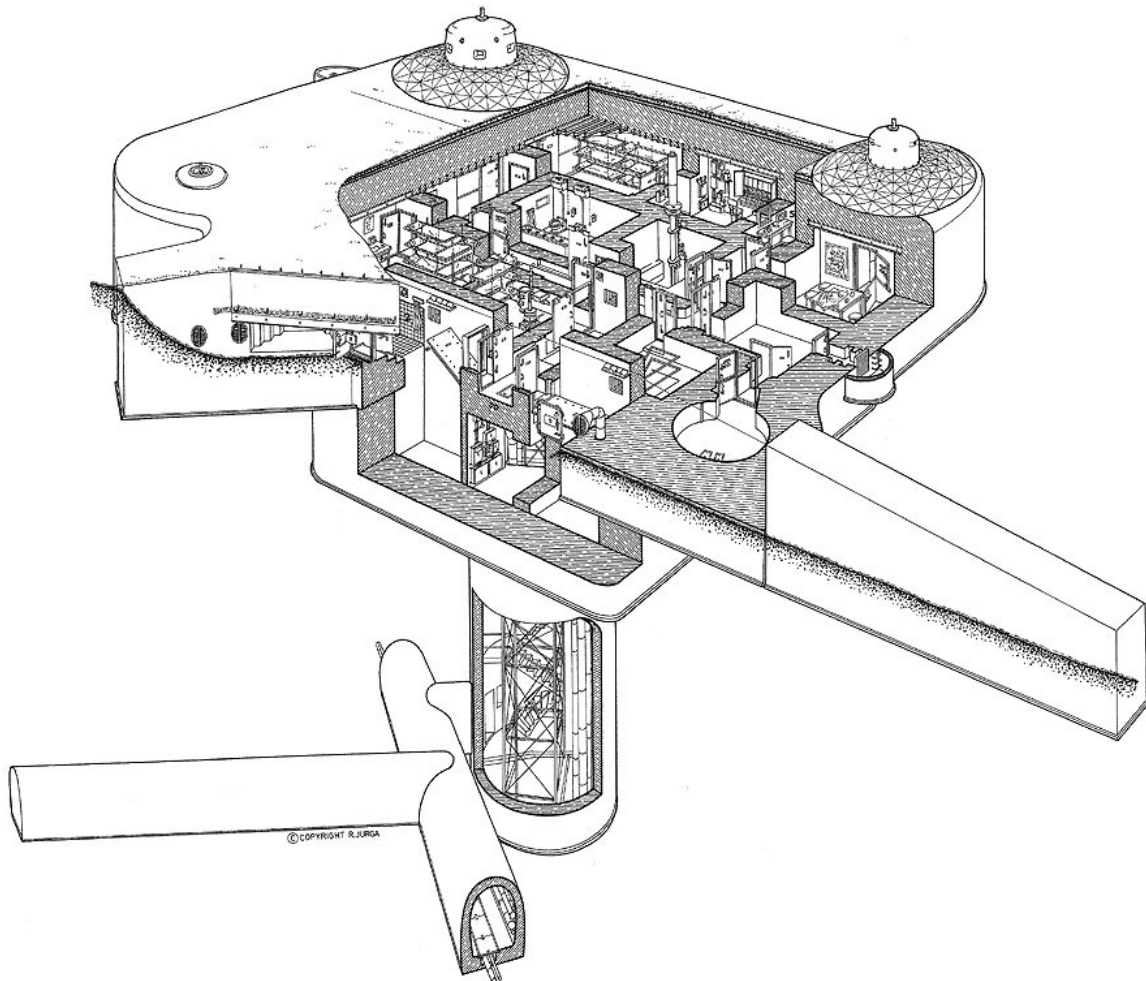
The Central Sector "Wysoka" starting south of Staropole, and ending on the lake Kursko, only about 15 km long, was to be especially studded with fortifications of B, A1, and A resistance class. The Germans planned to place as many as 11 such forts in that sector including 15 A-Werke, 13 A1-Werke, 79 B-Werke and 4 armoured batteries, more than half of which were to be connected by an underground system of tunnels. .

The German classification of bunker resistance according to J. Miniewicz and Robert Jurga is as follows:

- A - wall thickness 3.5 m, armour thickness 600 mm, resistant to multiple hitting with projectiles cal. 420-520 mm
- A1 - wall thickness 2.5 m, armour thickness 420 mm, resistant to multiple hitting with projectiles cal. 220-305 mm
- B - wall thickness 1.5 m, armour thickness 250 mm, resistant to multiple hitting with projectiles cal. 150-220 mm

Before the construction of the first bunkers in the Northern and Southern Sections started, as early as the beginning of 1936, aircraft flights over Ziemia Lubuska were forbidden. The Germans negotiated with the Polish authorities shifting the passageway for passenger airlines Berlin-Warsaw more to the south, outside the area of the construction of the Eastwall.

The construction of the bunkers of the Northern and Southern Sectors started in the summer 1936. That autumn a private German company "Barzewski and Ziemek" began to build the underground system of the Sector "Wysoka". Its starting points were locations of the first bunkers, built



Pz. W. 757 - Werkgruppe Schill, Festungsfront Oder - Warthe-Bogen © Robert Jurga

on the northern edge near Klszyca and on the southern edge near Boryszyn. The total length of the underground excavations was to reach around 35 km, but not much more than 25 km were actually constructed. The 1935 budget very soon became out of date, and the planned deadlines of its completion could not be met. The Eastwall plans were first modified in 1936, and the final version was prepared at the end of 1937. The modifications initially involved the supply of bunkers with armaments. Because of this, the original date of completing the construction was shifted from 1944 to 1951

The so-called Green Plan, made more detailed at the end of 1937, assumed that Germany would initiate its military operations in the east. In the spring 1938, Hitler, realising that he was shortly going to be attacking France, issued an order to reinforce the western fortifications and in the summer 1938 decided to stop the construction of the Eastwall. His argument was that he needed tank divisions, and not bunkers, for the fight on the eastern front, and that the cost of the planned work, including its completion, would equal those of forming five or six such divisions. Hitler's decision evoked a protest from the Inspector of Engineers and Fortifications, General Major Otto Forster who argued in favour of completing the construction of the Eastwall. This not only failed to affect Hitler's decision, but also resulted in the loss of its author's position! However, in the end, considering the arguments of experts, Hitler found a compromise solution, admitting that the Eastwall should be brought to defensive readiness.

The Todt Organisation took over the management of the construction. Todt concentrated on assembling of the installations and on earthwork at the forts already constructed. In accordance with Hitler's orders, only objects of B (B-Werke) resistance class were built. They had very modern and very strong anti-infantry armaments, but no anti-tank defensive capability. In mid 1939, instead of the name denoting the resistance of the constructed bunkers 'B-Werke', a propaganda name was introduced, which was supposed to discourage the enemy –

'Panzerwerke' (armoured bunkers). At that time the stations of the underground railway in the Sector "Wysoka" received names starting with letters of the telegraphic code: B - Bertha, H - Heinrich etc.

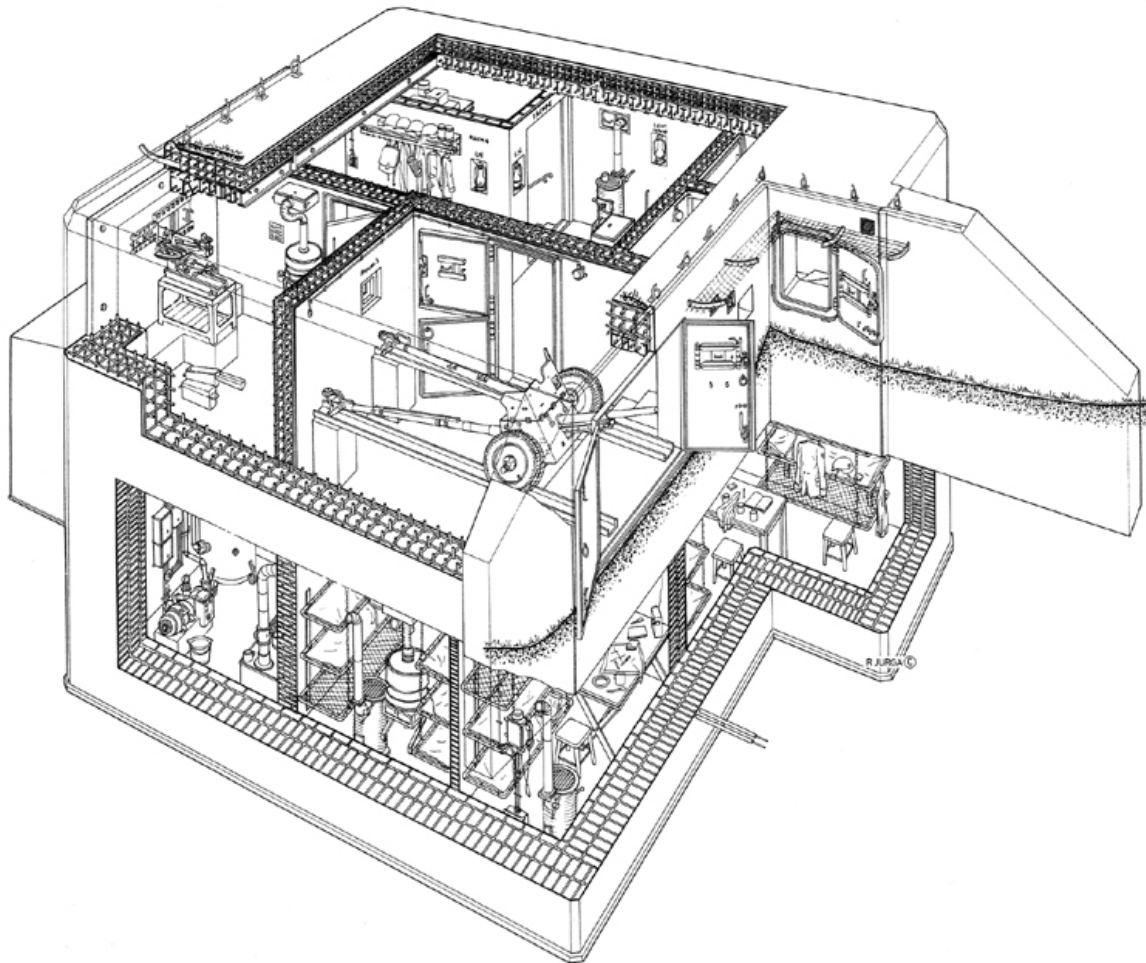
The successful attack on Poland in September 1939 gave rise to a gradual abandoning of all the work on the Eastwall. Up until this point, over the entire front of the Eastwall, which exceeded 80 km, 12 positions (Hindenburgstand) and 83 panzerwerks of various sizes had been built, of which 41 were situated in the Central Sector "Wysoka". This constituted about 25-30% of the planned fortifications of the Eastwall. With Poland crushed, and Russia an ally, this was not seen as a problem.

The tide of the war changed, and Russia changed sides and at the end of 1943 took the initiative on the eastern front, and the Eastwall gained importance again. However, Hitler, not admitting the requirement to defend Berlin, refused to discuss the subject. Only when the Russians arrived at the Vistula River, did defensive preparations start in earnest.

Because in 1944 it was found that the anti-tank obstacles, the so called dragon teeth, did not provide sufficient protection against tanks of a great weight and speed, it was decided to deepen the trenches situated in front of them and add a small rampart in front of it. The rampart was to keep the obstacle out of view and protect it against the fire of the anti-tank cannons. In marshy areas obstacles were made of steel spines or rows of deeply set wooden poles. The latter can still be seen today in the valley of the Struga Jeziorna stream, between Pz. W 739 and 741, and at the bridge on the Bledzew canal.

On January 12th 1945, the eastern front moved from the Vistula River. As a result of the powerful attack of the Soviet army, after 15 days the troops of the Red Army arrived at the Eastwall, near Trzciel.

On the night of 28/29 January 44 Guards Armoured Brigade, after crossing the Odra River, continued to march west and arrived in front of the Central Sector "Wysoka".



MG- Schartenstand und Pak - Unterstellraum, Festungsfront Oder - Warthe-Bogen © Robert Jurga

This section was defended by retreating and demoralised troops of the 9th Army.

As they advanced, the troops of 44 Guards Armoured Brigade were fired on by the German mortars. The Brigade Commander Colonel. J. Guskowski placed his troops in the fields behind Kalawa westwards, and awaited the engineers' reconnaissance to be completed. At that time the Eastwall remained silent.

The first exchange of fire took place at Panzerwerk 775, (10 years earlier visited by the Führer) which opened fire. The fight with this fort was short but violent. When it became impossible to defend it any longer, its crew probably blew themselves up. Thus on January 30th in the north the last shots were fired near Wysoka.

In the evening of January 31st the

Germans began their retreat from their battle positions in the Eastwall. The chaos and the lack of communication between the German troops prevented an efficient transfer of orders, and the soldiers, hearing the battle noise behind them (44 Guards Armoured Brigade), retreated in fear that they might be encircled. Only few panzerwerk crews, obeying orders, kept fighting somewhat longer, but in the night of February 1st the Germans deserted the fortifications.

The fortification system failed to fulfill its role. Aimed at a long-lasting defence, and in the case of the Central Sector "Wysoka" a defence of total encirclement, resisted for only three days.

Post-war fates of the Miedzyrzecz Fortified Front

Over the years the Eastwall has had various tenants. The Soviets, having

captured it, promptly dismantled all the that was valuable, especially technical



Entrance to one of the Bunkers Now sealed except for access for bats Photo by Robin Ware

equipment and armaments, and shipped them off to Russia.

The panzerwerks served as an experimental artillery shooting area, to check the efficiency of cumulative anti-tank and anti-concrete shells. The most obvious evidence of these events can be seen today on the armoured cupolas Pz.W 717 in the fortified group "Scharnhorst".

After removing the technical equipment, under direct orders of Stalin, a partial or complete dynamiting of the bunkers facing east (i.e., towards the USSR) started, in order to deprive them of their battle value. At the same time the Polish engineers removed mine fields from its foreground.

At the end of the 1940s, after the Soviet army left the area, hordes of scavengers descended upon it, and scrapped-out anything of value.

In 1953 the Polish Army manned part of the underground system and the dismantling and the looting stopped. The bunkers were cleared and the completely or partly damaged entrances bricked up. An inventory was made, and preservation work was done, consisting in painting the walls of chambers and corridors with white paint. The German signs were replaced with Polish ones. The numbering of the forts were changed from the German three-figure (Pz.W 717) to the

Polish four-figure (Ob. 2572).

It is rumoured that when the Sector "Wysoka" was manned by the Polish Army during the Cold War, an order was issued to direct the Miedzyrzecz Fortified Front to the west. No other work was done besides preservation, and the tunnels of the Sector "Wysoka" were adapted for storage of nuclear material; warheads apparently.

Once again dismantling started of what was left, again with the help of the army. The still-preserved cupolas and armour plating were dynamited, cut with gas and removed as scrap metal. Also "treasure seekers" appeared at that time, excited by the fact that after the war the treasures of Polish culture had been found there. They continued searching, contributing to the damage of the tunnels by excavating into the walls etc. The disassembling and looting in the area of the Sector "Wysoka" went on until the entrances to the tunnels were sealed in 1991.

The unused, abandoned and damaged tunnels were discovered also by bats, which were becoming increasingly numerous in the winter. As a result, on August 11th 1980 the Minister of Forestry and Wood Industry proclaimed a part of the Eastwall a nature reserve called "Nietoperek". Apart from a threat of turning the tunnels into a nuclear waste dump (the realisation of which thankfully did not materialise) the Eastwall's future looked secure. Interested tourists had to be organised in a way ensuring protection of the bats inhabiting the tunnels. The mayor of Miedzyrzecz prohibited entrance to the tunnels in order to protect the reserve and only official specialised guides were allowed to guide groups along the tourist route though sections of the tunnels.

So on July 15th 1991 the entrances to the forts and emplacements of the tourist route were fitted with gratings, and on December of the same year the last entrances to the tunnels of the Sector "Wysoka" in Miedzyrzecz District were closed.

Tony Page

FORTRESS ALDERNEY

Alderney is the most northerly of the Channel Islands, 3.5 miles X 1.5 miles and just 8 miles from the French coast. Unlike it's larger neighbours it's population is small and with few tourist attractions it's never crowded.

The Island has been fortified since Roman times culminating in a network of forts and batteries constructed in the mid 19th Century to repel a possible French invasion. During WW2 the fortifications were strengthened still further following the occupation of the Channel Islands in the summer of 1940 with an extension to Hitler's Atlantic Wall creating the impregnable 'Fortress Alderney'. New fortifications included coastal batteries, anti-aircraft batteries and infantry strongpoints and tunnels scattered across the island and these were the destination for eleven members of Sub Brit in February 2002. Our excursion however made a disappointing start.

We boarded our flight at Southampton Airport, an unusual Pillatus Britten-Norman BN-2A

MkIII-2 Trislander aircraft with a propeller on each wing and a third one on the tail, at least everyone got a window seat. As we approached Alderney it was soon obvious that we weren't descending and eventually the pilot leaned back and told us that a 65 knot side wind made it impossible to land at Alderney Airport and that we would be flying on to Guernsey where we would have to wait for the wind to drop sufficiently for us to return to Alderney.

As evening approached with no sign of the wind abating we were resigned to the fact that we would have to stay the night on

Guernsey and hope for better weather the following morning.

The following day there was still a strong wind but it had changed direction and on arrival at the airport we were told our flight would be departing for Alderney shortly. Having touched down we picked up two hire cars at the airport and drove the short distance to our base for the week.



Fort Clonque Photo Dan McKenzie

Fort Clonque is the most westerly of the Victorian fortifications. It was completed in 1855 and stands on a small island connected to the 'mainland' by a 220 yard natural causeway that is covered by the sea high tide. The fort was designed to mount 10 guns in four batteries with barrack accommodation for 59 men. It was later modified by the Germans with the addition of a generator room and a casemate for a 105mm gun.

Fort Clonque has now been superbly restored to its original condition by the Landmark Trust and is now one of the

islands top holiday homes. It is of course expensive during the summer but in February it was just £596 for 7 nights and that's for the whole fort not each. It worked out at about £40 each for five days, a real bargain.

Our first destination was to Water Lane a short distance (all distances are short in Alderney) north east of the capital and only town St. Anne. Four major tunnels were constructed by the Germans for the storage of munitions and fuel. Two of these are in Water Lane on either side of a narrow wooded valley. Both tunnels are 'horseshoe' shaped with two entrances. We entered the tunnel on the west side of

chambers on the left, one is about 8 feet in height and the second, ten yards beyond it is about 15 feet high. Both are 35 yards in length. There is a 60cm tramway laid throughout much of the tunnel including the chambers and at the junction with one of these chamber is the remains of a turntable leaning against the wall.

After a further 75 yards the tunnel turns to the right towards a second entrance. At this point there is a second branch curving to the left, this also appears to be about 100 feet long but after a short distance the mud was too deep to make further progress.



The Junction of Water Lane Tunnel Photo By Nick Catford

Although there is a large amount of debris on the floor making passage through the tunnel slow and difficult at times, the walls appear reasonably sound and the tunnel is safe to enter. As well as the storage of munitions and personnel, this tunnel apparently housed an electricity generating station although no evidence

Water Lane, it is now largely unlined although it was originally lined with timber which has now fallen away and lies rotting on the floor. The tunnel is wet throughout with deep mud in places and several roof falls to climb over. After about 50 yards the tunnel bends to the right and a branch comes in from the left. The branch is about 100 yards long with a large roof fall near the end.

Back in the main tunnel after a further 75 yards there are two concrete lined storage

remains. The northern portal is close to two houses on the opposite side of the valley between the houses is the northern entrance to the second tunnel. Internally this is very similar with two branch tunnels, each somewhat longer and two concrete lined chambers, one higher than the other. One of these chambers contains a number of bed frames indicating that it was used as a personnel shelter. The southern portal is blocked by a roof fall and its position is not visible on the surface. Initially the tunnel is dry with

the floor strewn with rubbish but after a few yards there is mud and debris which becomes somewhat deeper than the western tunnel making progress very difficult at times. It was impossible to reach the ends of the two branch tunnels.

From Water Lane we drove to Mannez quarry to see the impressive naval fire control tower which consists of three observation levels each controlling a separate battery. Behind each observation slot are a number of other rooms on each level. These rooms were completely separated from the observation areas for blast protection and have been stripped with only a few electrical fittings remaining along with some of the blast overpressure valves. The building is open but just inside the entrance there is a gaping hole in the floor which has been bridged with timber. There is one floor entirely below ground which would have housed the plant, there is also evidence of fittings for bunks. Around the observation tower is the extensive Flak Battery Höhe 145 (Anti aircraft battery) which we decided we would return to on another day.

Below the observation tower on the quarry floor is the eastern terminus of the island's railway system. At the end of the line is a two car set of ex Northern line 1959 tube stock, this has been restored and repainted. The two car train came to the island in 2001 replacing the 1938 tube stock that was acquired from the Historic Chatham Dockyard in 1987. The motive power is provided by a two small diesel locos (Elizabeth and Molly) which are stored in a locked engine shed at the end of the line. The line, which only runs in the summer terminates at the harbour at St. Anne two

miles away. This is the only working railway on any of the Channel Islands. It was inaugurated by Queen Victoria and Prince Albert and celebrated its 150th birthday in 1997.

At the eastern end of the quarry is a large derelict travelling crane with a number of ballast wagons behind it. Behind the crane is the open entrance to another German tunnel which we decided to explore on another day as the light was fading fast.

Day three started bright and sunny. We split into two groups and set out to explore some more of Alderney's



Fire Control Tower - Mannez Quarry Photo By Nick Catford

underground attractions. Our first stop was at the site of the former Concentration Camp (one of four labour camps on the island), 'Lager Sylt', nothing much remains of this unique site, the only concentration camp on British soil. The camp was completely cleared by the Germans before the end of the war, presumably to cover their tracks. It is clearly identified by two concrete gate posts (the entrance to the camp) alongside an unmade road close to the southern

perimeter of the airport. We also found a short concrete lined tunnel that connected the camp commandant's house outside the perimeter fence to the camp, entering the camp below the ablutions block in a 3 metre square room with stairs up to the surface. This tunnel is 2 metres high and about 10 metres in length. The commandant's house was demolished in 1989 and moved to another site on the island. In the vicinity we also found a well preserved conical concrete sentry post, one of at least three that still exist and only usable by thin people!

We then moved onto a anti-tank wall at eastern end of the island at Longis Beach where we visited a machine gun bunker at one end of this wall next to 'The Nunnery' and 18th century fortification defending Longis Bay. The bunker, which was open, had a number of rooms some of which was used for troop accommodation and one with a crenel facing the beach to enfilade the beach with machine gun fire. The bunker was in excellent condition and had a Tobruk type machine gun position on the roof. We then walked along the beautiful deserted beach to another anti-tank bunker with a crenel built into the wall itself.

We returned to Mannez (pronounced Maunz) Quarry where we saw a number of bunkers close to the cliff top above the quarry. Behind the direction finding tower we had investigated the previous day is the 'Höhe 145' Flak Battery consisting of two 2cm flak emplacements, each built on top of an accommodation bunker and magazine. There were also six 8.8cm flak emplacements and the battery command post. All were open and easily accessible. We returned to the quarry floor to explore the German munitions tunnel we had seen the previous day. Like the other major tunnels on the island it runs in a semi circle with another entrance close to the railway terminal. The tunnel is unlined throughout and generally dry and in good internal condition. The western entrance was wide open while the eastern entrance was partially back filled but still passable. The tunnel is about 300 yards in length. Some rubbish, including a number of old tube train seats have been dumped inside the eastern entrance.

The one arranged trip during the week was to the Hospital bunker which had been arranged by the very helpful Ilona Soane-Sands from the Alderney Tourist Office. We were met at the site by Ilona and Col Peter Walter, who is in charge of the Island Militia and Civil Defence. During the war plans were drawn up to excavate an underground military hospital as on Jersey and Guernsey. Construction never started and a former munitions bunker in a small quarry on the south side of Longis Road was utilised as the central surgical unit with two area first aid bunkers at either end of the island, one on Rose Farm on the north side of the airport at the other just east of Whitegates. All three bunkers still exist.

After the war the surgical bunker was adapted to house the island's Civil Defence Unit. Unlike the mainland where the Civil Defence Corps was disbanded in 1968, in the Channel Islands it was retained through the cold war and is still functioning today. In the 1980's the Royal Alderney Militia was reactivated by a retired SAS officer, Col. Peter Walter and this is now co-located in the former German bunker.

Although internally all parts of the bunker are linked together, Civil Defence and the Militia have their own entrance complete with a name plaque above each door. The entrance to the Civil Defence side of the bunker is through a metal grille and two gas tight steel doors. Once inside, the first room on the right is the militia armoury which we were unable to see. Next to it is the radio room and straight ahead through an archway, the Civil Defence operations room with 'CD Ops. Room' above the door. The 'ops.' room is approx 15 ft by 10 ft and contains a television, video recorder map of the world, tables, chairs, and a rack of transceivers, plus various military posters one showing how to identify Russian Hind helicopters.

Passing out of the 'ops.' room to the left there is a short corridor, the first room on the right is the CD storeroom, and the next room and beside it the small kitchen and bar. The corridor enters the main Militia training room, and from this a short corridor leads to the Militia entrance consisting of two further gas tight doors

and the Militia storeroom full of uniforms. Access to the flooded lower floor is from this corridor consisting of a ladder and an ammunition chute. In the event of nuclear or chemical attack the bunker is fully self sufficient with ventilation plant and standby generator. Outside the bunker there is a communications mast and an office in a small portacabin.

Alderney Civil Defence comes under the jurisdiction of Guernsey with joint monthly exercises. They also take part in a yearly international exercise (INTEX) and are connected to the emergency communications network by radio. Colonel Walter's Militia cadet force trains

weekly often utilising disused Victorian and German fortifications. The bunker also houses the Alderney monitoring post, this is in the radio room and serves a similar function to the Royal Observer Corps posts on the mainland. The post is still fully operational although in peacetime is unmanned. The monitoring instrument is a Mini Instruments 7-40, measuring temperature, wind speed, wind direction and radiation levels

from sensors and detectors mounted on the roof. This data is then relayed to CD HQ at La Corbinerie on Guernsey. These days the nuclear threat is more likely to come from an accident at the nuclear waste reprocessing plant at Valognes near Cherbourg than from nuclear weapons.

From the CD HQ we drove to Essex Hill which overlooks Longis Bay. Here we found our final munitions tunnel with its entrance located in a wooded quarry face

(WA59330797). The tunnel is about 400 yards in length and again runs in a semi circle to a partially blocked and overgrown entrance. The tunnel is unlined throughout as are three short munitions storage chambers close to the middle of the tunnel. There is also a short section of 60cm tramway in place towards the centre of the tunnel. The tunnel is dry and safe to enter with a small roof fall in the centre that is easily passed. We briefly looked at another anti-aircraft (Flak) battery on Essex Hill but this wasn't so well preserved as that at Mannez Quarry. We found one square Flak emplacement and a two level building of indeterminate use.



Mannez quarry Tunnel Photo by Nick Catford

Staying at the same end of the island we visited at the German telephone exchange close to the coastguard cottages at Whitegates. There was nothing to tell this bunker apart from any other munitions bunker on the island, it is currently being used for storage. Close by was what we took to be a small shelter of some kind consisting of a crawl over back fill into a single room with a curved corrugated metal roof. There was a strange square brick structure in one corner with a

circular hole in the top. It's unclear what it contained.

Our final visit of the day was to one of the Victorian Forts that ring the island. Fort Albert is the biggest fort and is now in a derelict state and used by the Alderney States Council as a work and storage yard. The large parade ground is a mess and rubble strewn with the remains of the barrack blocks that were blown up a few years ago to discourage squatters. It is still possible to walk round the ramparts past three gun batteries overlooking Saye, Corblets & Longis Bays. We were able to get into one of the magazines below where Victorian shell and cartridge lifts were still in place. Before we could explore the fort further we heard a shout from the gate and we were beckoned back. Apparently we had been locked in the fort some time earlier and a council worker had spotted us walking along the ramparts and came to release us bringing to an end a highly enjoyable day.

On the 4th day we made our way to the Biberkopf strongpoint, below Fort Albert and overlooking Saye Bay. On the Island, the German defences are divided into three types; batteries, strongpoints and resistance nests. Resistance nests are the smallest with at least one anti-tank gun, machine gun and mortar emplacements interconnected by communication and rifle trenches. The perimeters were surrounded by barbed wire and often anti-tank and anti-personnel minefields. The strongpoint was larger with heavier weapons either sited in casemates or open pits with separate 'bunkers' for the command post, personnel and supplies. Each strongpoint was surrounded by fieldworks and manned by at least a company while local defence was provided by light anti-aircraft guns, anti-tank guns and machine guns.

The strongpoint at Bieberkopf is particularly well preserved, it's most impressive feature being the 10.5cm coast defence gun in a casemate on Bibette Head. When built the casemate was camouflaged with a render of beach pebbles but much of this has now fallen away. The casemate is partially flooded but just inside the rear entrance a passage way leads off to the right to a

tunnel running for some length through the rock of Bibette Head. Halfway along the tunnel steps lead up to a small Tobruk emplacement on top of the head, beyond this point the water gets deeper and eventually a ladder is reached up to a large rusting steel cupola at the tip of the head. The cupola resembles those seen on the Maginot line, it has four machine gun ports. Other similar cupolas existed on Alderney but this is the only one to survive, it's precarious position making removal for scrap difficult. There is a smaller 4.7cm PAK casemate overlooking Saye Bay which housed a Czech anti-tank gun. Other buildings within the strongpoint include a heavy machine gun emplacement, Tobruk and mortar pits and a searchlight emplacement with a short section of tramway within it. This has, at some time, been turned into a summerhouse but is now derelict. There is also a locked garage within the site which has an old car inside it.

The fortifications continue all the way up the hill up to the Fort Albert moat. On the east side of the fort there is one of two water storage bunkers on the island. The tanks have now been removed but their position is clearly visible in each of two rooms within the bunker and some of the pipes are still in place. On the north side of the fort and overlooking Biberkopf Strongpoint is a small observation post with a light machine gun emplacement on top of it. Close by is underground command centre for Battery Marcks, after the war the armoured rangefinder that was mounted on its roof was removed and the resulting hole has now been concreted over. Below ground several large underground rooms still survive and at the back of the bunker is a tunnel into the moat of the fort. The unlined tunnel, about 25 feet in length is heavily propped with timber supports but is in a very dangerous state with the roof sagging badly. It is possible to get through into the moat but this is not recommended as touching the roof or the props could bring the whole thing down. Inside the moat steps lead up into the fort through an old tunnel; the way on had however been recently blocked with breeze blocks.

From the footpath that runs along the north side of the fort moat we were also

able to look down on Battery Marcks (built on top of the 1902 Roselle Battery) which is a short distance to the west of Bieberkopf Strongpoint. The battery consists of four 10.5cm casemates which remain in good condition. One of the casemates now houses a pumping station. Two 1902 searchlights are still intact below the battery on Roselle Point.

Our next port of call was the Fortress Commanders Bunker at La Rochers. This is located in undergrowth on the north side of a track running east from Val Longis (WA58230767). This is a two level bunker almost completely underground and difficult to see unless you are on top of it. The

bunker is leased to Colin Partridge and Trevor Davenport, joint authors of 'The Fortifications of Alderney' (ISBN 9517156 0 7) but it is probably the worst condition bunker that we visited. It is left open and has been heavily vandalised and fire damaged, especially on the upper floor. In one room on the upper floor there is still some electrical switchgear in one of the rooms, and on the lower floor

which has suffered less from smoke damage, most of the steel doors are still in place.

In St. Anne there is a impressive Luftwaffe HQ bunker and tower which formed a link in the German coast-watching surveillance of occupied Europe. The bunker is located in Les Mauraiux (WA57200740) and is currently used by the Alderney Water Board as a store. The

bunker consists of 9 rooms with the five storey observation tower behind it. We were unable to arrange access to the inside on this occasion. This was the second of the water storage bunkers described earlier.

Our next visit was to a most interesting site the Artillery Commandant's Bunker and beside it at La Rond But (WA57900694) the remains of the Freya coast watching radar. The radar consists of an open topped building with the rusting bottom half of the radar mounting still in place. The bunker, which is completely underground apart from the sunken entrance is a single level, similar



Strongpoint Bieberkopf Photo Nick Catford

in layout to the top floor of the Fortress Commanders Bunker. It is in good internal condition with some wiring, electrical fittings and ventilation trunking still in place. Most of the internal doors are still intact as is the heavy gas tight entrance door which, like many outer doors, opens in two halves. This is in case debris falls in front of the door stopping it being opened from the inside. Although the bunker is used for farm stores it's left

open as are most of the bunkers on the island. When in use the bunker would have been supplied with data from all the batteries using optical range-finders.

We took a break from fortifications to look at a modern construction at Les Quatre Vents where a vast new building has been abandoned by its Sicilian construction crew. It is little more than a shell and was apparently going to be an agricultural centre. It is a two storey 'U' shaped building with a basement. The whole site is stacked with abandoned builders materials and there are local rumours of Mafia connections. One interesting feature is a low (you can't quite walk upright) concrete lined tunnel under a footpath from the building site to the top of a valley that leads down to the sea. Apparently this lavishly constructed tunnel and it's approach cutting was built to give access to the valley which is also owned by the Sicilian company who own the site. Work on the site apparently stopped several years ago and is due to restart soon.

Back to fortifications, by now the weather was deteriorating so we drove into town and called in at the tourist office where we met Roland Gauvin from the Alderney Wildlife Trust who is one of the part time staff. Roland invited us back to his house at 'The Nunnery' explaining that he had two German bunkers in his garden, a small machine gun emplacement and a personnel shelter. We arranged to meet him later that afternoon. On the way to his house we called at the 18th Century Frying Pan Battery, an extension of the Longis Lines. Amongst the early structures is a particularly well preserved German searchlight emplacement complete with external tramway and turntable.

Being in a private garden the two bunkers are well preserved. The machine gun emplacement has been fitted out as a bunkhouse but still retains some original features. Unusually the external and internal doors are of thick timber offering little blast or gas protection. Roland thought they might be later replacements but I think this is unlikely as they looked very old and had spy holes cut into them. The machine gun table is still in place and seems to have been made out of part of a

wooden cable drum, cut in half and cut to fit the shape of the walls. Outside the bunker there is an embossed edelweiss above the door and a short ladder up onto the roof where there is a light machine gun emplacement. The small personnel shelter alongside is still used for storage with all its doors intact including, unusually the low steel door giving access to the emergency escape shaft.

We were joined by Trevor Davenport, co-author of 'The Fortifications of Alderney' who told us about various other tunnels and bunkers on the island, it's a shame we hadn't met him a couple of days earlier. We told him that we were planning to return next year and he said he would be happy to show us some of the harder to find sites.

On the day of our departure it was very foggy and it was unclear if we would be able to get a flight out. Having left our bags at the airport (it's common practice to leave unattended bags at Alderney Airport) we drove to east of the island to look at the site of the Borkum Labour camp (WA586074) which is on a dead end road to the council rubbish tip where the islanders are free to throw their refuse off the cliff. We had seen the site from the air and quite honestly it's a total disgrace that this is still allowed to happen. Little evidence remains of the camp apart from two sets of concrete gate posts alongside the road. These marked the original entrance to the camp. We then had a brief look at the site of a German Military Cemetery in Longis Road, close to the current island cemetery and then the site of the Norderney Labour Camp at Saye Bay (WA599088). This is now used as the island camp site with some hut bases remaining. One interesting feature still remaining is a short tramway tunnel taking a railway line through the camp under the road to Arch Bay.

Our final major site was Battery Annes on the west side of the island (WA556066) at Giffoine, overlooking Hannaine Bay. This is a large coastal battery (also known as West Battery) mounting four 15cm naval turreted guns with an effective range of 13 miles. They are each housed in open concrete pits surrounded by circular underground ready magazines. All the

magazines were open and accessible with much of the mechanism (two per pit) for transferring the shells to the guns above still intact. There is an old diesel engine in one of the magazine entrance tunnels, it is unclear if this had any wartime use or was placed there later. Each gun emplacement has an underground personnel shelter alongside with two machine gun protected entrances and a Tobruk machine gun position on the roof. Only one of these shelters was accessible (the other three being locked) and this appears to have been used as a house with kitchen appliances, furniture and a bath. Just inside the entrance is a lifelike dummy sitting in a chair. It has Wellington boots on and is sitting with its head slumped as if dead. It is holding a saw in one of its gloved hands and in the semi light looked very lifelike.

There are two underground munitions bunkers on the site. We were able to get into one of them which consisted of four long empty rooms. The other is locked and is apparently used as a discotheque, presumably holes have been knocked through the dividing walls making one large room. The final structure on the site is the battery command post linked to a personnel shelter by a trench. The

command post (WA55530677) is located very close to the top of the cliff and is completely underground accessed by several flights of concrete steps. Unfortunately there has been an attempt to blow it up after the war and there is now a gaping hole in the roof from where the armoured rangefinder was removed. Little remains inside apart from some internal doors and ventilation trunking.

By now the weather had improved and we returned to the airport to find all the days flights had been crammed into a few hours. Some of us were able to catch an earlier flight which, because of the delays took off slightly later than our intended flight should have left. It was interesting to note that the security staff had gone home and we were able to board the plane without being checked!

Those present were Dan McKenzie, John Burgess, Tony Page, Nick Catford, Robin Ware, Paul Sowan, Bob Clary, Mike Clarkson, Pete Walker, Keith Ward and Jason Green.

Nick Catford

West Norwood Cemetery Catacombs

With an ever increasing urban population and overcrowded churchyards the first public cemeteries in London, distinct from those associated with churches, appeared in the first half of the 19th Century. There had been some burial grounds for non-conformists in the 17th Century with many more established in the 18th Century. The first London Cemetery opened at Kensal Green in 1827 with West Norwood following ten years later.

The cemetery was opened by the South Metropolitan Cemetery Company, one of 8 private cemetery companies authorised by Acts of Parliament to alleviate the overcrowding by establishing public burial sites around the capital. The company acquired 40 acres of land at Norwood within the Parish of Lambeth in 1836. One of the company directors and its architect was William Tite (later Sir. William), president of the Royal Institution of British Architects.

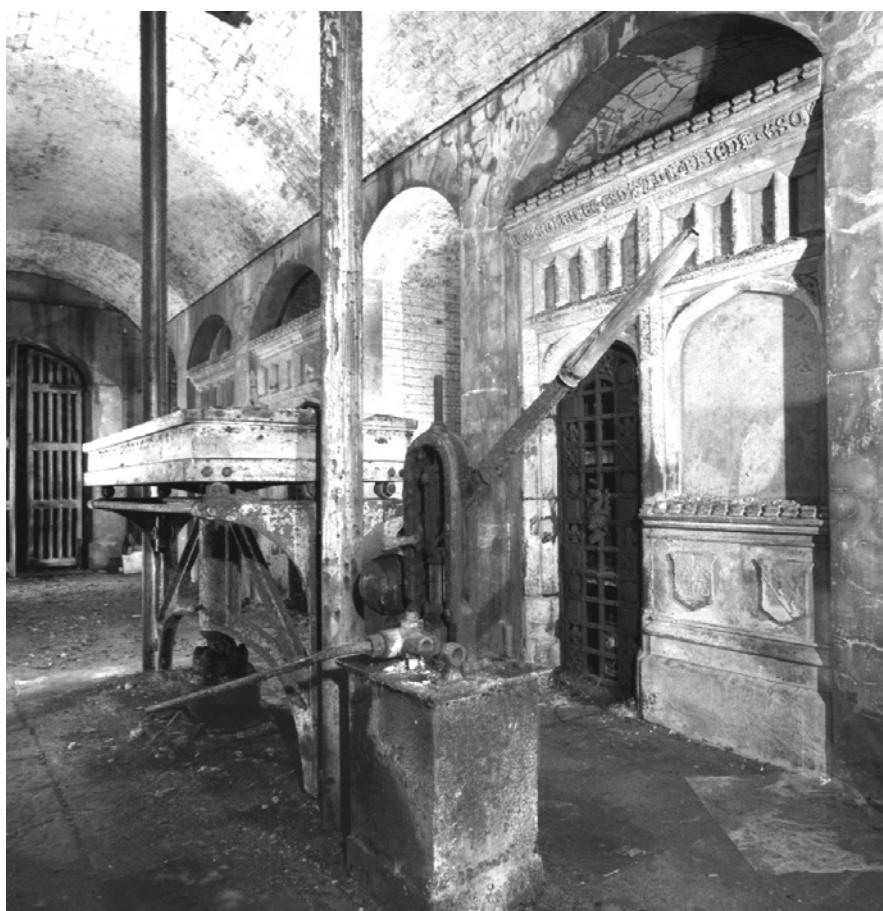
Tite planned the layout of the site, which

included two chapels with a series of vaults or catacombs constructed beneath the Episcopal Chapel (similar in style to Kings College Chapel). This included a hydraulic coffin lift or catafalque to transport the coffins from the chapel to the vaults below.

Both chapels were severely damaged during the war and the Episcopal Chapel was finally demolished in 1955 and replaced by a walled rose garden, the catacombs below were undamaged and remain intact and accessible today.

The London Borough of Lambeth bought the Cemetery in 1966. It was their intention to continue with the cremation service and turn the grounds into a memorial park although several years of neglect and bad management led to considerable damage to numerous tombs and the destruction of a number of listed structures. There are 64 Grade 2 and Grade 2* listed monuments and memorials on the site and the Friends of West Norwood cemetery arrange regular tours with occasional visits to the catacombs

blocked at ceiling level that once provided access from the chapel above. There are eight narrower vaulted passages, three on each side, emanating from this main tunnel, each of these has a number of bays on either side some of these contain gated vaults, some of have been shelved and stacked with coffins while others remain unused and empty. At the end of each of these passages is an open grating just outside the walls of the rose garden above. By law all burials not actually in the ground must be in lead lined coffins.



The coffin lift or catafalque Photo Nick Catford

(Contact Membership Secretary Rosemary Comber, 63, Bradley Road, London, SE19 3NT).

The catacombs consist of a wide vaulted spine corridor with the catafalque intact and disused in the middle. There are a number of vaults with intricate wrought iron gates opening onto this central corridor. There is also a stairway, now

Much of the wood has rotted over the years but generally the lead lined boxes within are intact although a few have been vandalised.

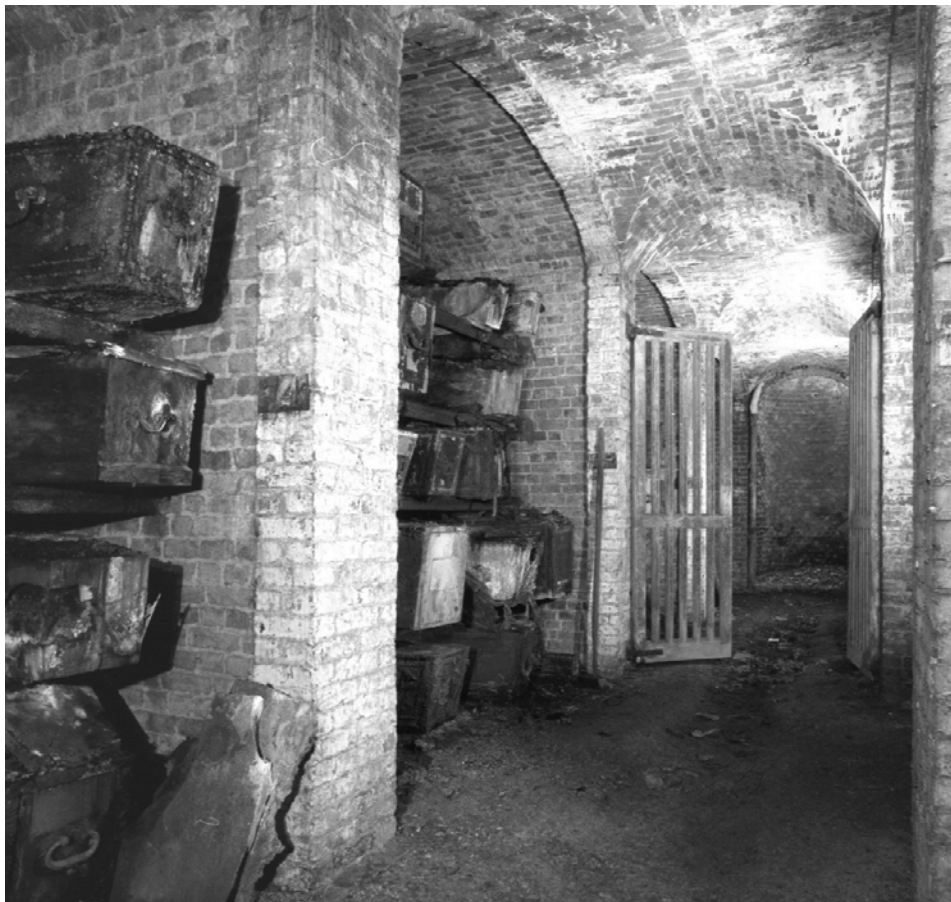
The coffin lift made Bramah & Robinson was installed in 1839. It was worked by hydraulics, which made its operation silent, which was a distinct advantage considering its use. Only the top of the

catafalque on which the coffin was placed was moveable and could be swivelled to allow easy removal of the coffin in the catacombs. The system used a single pump.

Bramah & Robinson, also installed a similar coffin lift at Kensal Green Cemetery Catacombs in 1844. The main difference is that the whole structure can be raised and lowered and incorporates 2 pumps. At Kensal Green the box on which the pumps are mounted contains

which bypasses both pump, and valves, feeding water directly from the ram cylinder to the reservoir. One stroke of the pump will raise the catafalque by one inch; therefore 180 strokes are required to raise it to the fully elevated position, a distance of approximately 15 feet. The effort is halved by virtue of the two pumps.

The coffin lift at Kensal Green has recently been fully restored and is available for use for transporting coffins from the Anglican



Coffins stacked in two bays Photo by Nick Catford

the hydraulic fluid (water). The rams are of 2 in diameter and 5.5 in stroke. The cylinder in which the ram fits extends into the reservoir and is terminated by a non-return ball valve. The upward stroke sucks water into the pump cylinder, then the downward stroke of the ram forces water through a second one-way valve and thence to the main lifting ram. The wheel controls the descent by operating a valve,

Mortuary Chapel Above. That at West Norwood while still largely intact is derelict and unusable.

Technical information on Kensal Green hydraulics by Edward S. Pepper.

Nick Catford